

VOL. II.

No. 3.

JANUARY, 1887.

Price, 3 cents.

THE

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| THE OCCURRENCE AND FABRICATION OF ROCK CRYSTALS, - | 17 |
| NEW JERSEY'S NEW MINE, - - - - - | 18 |
| ITEMS OF INTEREST, - - - - - | 18 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - | 19 |
| EDITORIALS, - - - - - | 20 |
| HINTS, - - - - - | 20 |
| EXCHANGES, - - - - - | 21 |
| RELICS OF THE MOUND-BUILDERS, - - - - - | 22 |
| THE NICARAGUAN FOOTPRINTS, - - - - - | 22 |
| THE WHEATLEY MINE, - - - - - | 23 |
| PROCESS FOR BURNING DIAMONDS, - - - - - | 23 |
| MINERALOGICAL CLUB OF THE N. Y. ACADEMY OF SCIENCE, - | 24 |
| WHAT WE KNOW ABOUT METEORITES, - - - - - | 24 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.



THE Corona NEWS-LETTER

contains Mathematical Problems and Puzzles, Specimens of Modern Job Printing, Sketches of Life in a New York Printing Office, etc. Try the "Cat Problem," the "Steamer Problem," Judge Duffy's Quadratics, etc. Issued every 2 weeks, 50 cents a year—Sample, 2 cts.

Address NEWS-LETTER, Corona, Bergen Co., N. J.

WM. NIVEN,

DEALER IN

FINE MINERAL SPECIMENS

AND

OBJECTS OF ART AND GENERAL USE

MADE FROM

JASPERIZED WOOD, LABRADORITE,
CROCIDOLITE, CARNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, ETC., ETC.

A SPECIALTY MADE OF

JAPANESE CRYSTAL BALLS
OF ALL SIZES.

739 BROADWAY, NEW YORK.

JOB PRINTING, POST-PAID BY MAIL

100 Letter Heads, name and business on, 35 cents. Envelopes and Business Cards same price. 1000 Circulars, 4x6, \$1.50. 1000 Circulars 6x9, \$2. All job printing equally low. We make a Specialty of Job Printing for *Naturalists and Collectors*, Papers or Magazines, Circulars, Price Lists, Labels, Data Blanks, etc. Send stamp for samples and prices. Our paper, THE PEOPLE'S PRESS, 25c. a year. R. M. RULISON, Flushing, Michigan.

10 handsome minerals 10 cts., or 30 choice specimens mailed for 25 cts.; 25 minerals, 1x1 inches, 50 cts.; 60 specimens, 1x1 inches, \$1.00. All minerals named, and strictly first-class. Stock at cost to close out business. Catalogues free. A. N. FULLER, Lawrence, Kansas.

MAZON CREEK FOSSILS.

Having about 200 of these celebrated Fossils which I wish to clear out, I am offering them at 15 c. each, 8 for \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

MINERALS.

The undersigned having completed arrangements to travel through the South finds it necessary to dispose of his large stock of duplicates, either by single specimens or by collections.

Analcite, apatite, albite, stilbite (rat.), stilbite (mas.), cryolite, rutile, celestite, moonstone, leucite, wernerite, pyromorphite, calamine, blende, beryl, barite, selenite, tourmaline, scapolite, acadialite, prehnite, chalcophryte, chondrodite, apophyllite, fluorspar, oligoclase, pectolite, siderite, chalybite, brucite, galenite, calcite, natrolite, chabazite, wavellite, hematite, lithomarge, pyrrhotite, pyrite, mica, zincite, sphalerite, vesuvianite, obsidian, limonite, actinolite, serpentine, silicified wood, cyanite, drusy quartz, franklinite, amethyst, carnelian, chalcedony, moss agate, graphite, arsenopyrite, cinnamon, authoite, azurite, aragonite, dolomite, vermiculite, vivianite, pyrolusite, magnetized muscovite, cerussite, jefferisite, molybdenite.

Collections for amateurs and advanced collectors a specialty.

I have also a large lot of fine coal fossils and limestone fossils. Address,

T. J. LEWIS,

710 N. 22d St., Phila., Pa.

SPHALERITE,

OR

RUBY BLENDE.

I have just received from

JOPLIN, MO.

about 300 fine specimens of this beautiful mineral, which represent the

CREAM

of all the specimens taken from these celebrated mines, and will sell them at

25 Cents to \$2.00

a specimen. This is a rare chance to secure a fine specimen of this mineral cheap.

A. CHAMBERLAIN,

284 PAVONIA AVE., JERSEY CITY, N. J.

WANTED! Everybody to send 10 cents for the *Agents' World* four months on trial, and have their name inserted in the *Agents' Directory*, from which they will receive hundreds of samples, circulars, etc., and piles of good reading matter free. AGENTS' WORLD PUB. CO., Passumpsic, Vt.



THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., JANUARY, 1887.

NO. 3.

THE OCCURRENCE AND FABRICATION OF ROCK CRYSTAL.

(FROM THE SCIENTIFIC AMERICAN.)

PART III.

Of the many forms of manufactured rock crystal, the sphere has always been a favorite. One of the largest and most perfect ones known is in the Dresden Green Vaults. It weighs 15 German pounds, and is 6.69 inches in diameter. It was undoubtedly used for purposes of augury. The finest ball in this country is that in the possession of Mr. R. E. Moore. It is 6.625 inches in diameter, and is valued at \$5000. It was made in Japan, and is a tama, or jewel ball, absolutely pure. The stand is of Indian workmanship. Another ball in the possession of the same collector, though much smaller, is of interest as an excellent example of the Japanese fondness for representing crystal balls borne aloft

by the waves. The stand is of bronze, and an admirable imitation of a succession of

waves. The largest ball, 2.5 inches in diameter, rests on the crest, while three

smaller balls, all under an inch in diameter, are distributed about the base. A 4.5 inch ball, of exceeding purity, was sold in the Morgan collection last winter for \$1750. It was mounted on a silver stand, ornamented with a golden dragon and other figures, and containing the private or palace seal of the Mikado. The stand alone was estimated to be worth \$800. There are a number of other crystal balls in this country which are worthy of mention. Mr. Samuel Nickerson, of Chicago, has one measuring 5.625 inches in diameter, which was brought from Japan by Commodore Perry. It is valued at \$2500. Mr. Brayton Ives has one of the same size valued at \$3000. A ball in the possession of Mr. Heber Bishop has a diameter of 5.875 inches, and Mr. Walter of Baltimore, owns another 5.75

inches in diameter. The high prices of crystal balls are not due to the cost of



Sci. Am. N.Y.

fabrication, as is commonly supposed, but simply to the extreme rarity of masses of rock crystal which will afford absolutely pure spheres from 3.5 inches in diameter upward. The constant demand for these beautiful objects, which has at all times been greater than the supply, warants the belief that their value is increasing, and that in years to come they will be even more difficult to obtain than at present. The numerous valuable cabinets in this country cannot boast the possession of half a dozen perfect crystal balls over five inches in diameter. It is undoubtedly the material, and not the skill, that is lacking. Thus, for instance, the facilities for working hard minerals in the Oberstein district in Germany are so excellent that a dish of agate, 13 inches long, 8 wide, and over 3 deep, which had been reduced to one-eighth of an inch in thickness, sold in New York for \$200, in spite of duty and the profits of three dealers. In the United States the facilities for crystal cutting are also excellent, but large masses of the material are rare. There are now three parties who have machinery such as is used in the Oberstein district, and who are prepared to manufacture perfect crystal balls at the following prices: 1 inch, \$1; 2 inches \$5 to \$8; 3 inches, \$15 to \$25; 4 inches, \$40 to \$75; 5 inches, \$125 to \$150; 6 inches, \$200 to \$300; 7 inches, \$300 to \$400; and intermediate sizes in proportion.

[TO BE CONTINUED.]

New Jersey's New Mine.

A GREAT VEIN OF CHOICE RED OXIDE IRON
UNCOVERED NEAR PHILLIPSBURG.

MARBLE HILL, two miles from this place, has been purchased by a number of Philadelphia capitalists from Henry Fulmer, of Easton, and a large force of men have been put at work digging ore. The character of this ore is a choice red oxide, analyzing in metallic iron from 55 to 70 per cent. The ore is of the Bessemer quality and shows up in true vein form. A blast showed a vein twenty-three feet wide, and the indications are that this mine will be one of the

largest developed in New Jersey. A monster engine has been erected at the mine and larger machinery to increase the output to four thousand tons per month is being constructed. It is externally a mountain of iron, and all indications are that it is inexhaustible. The profits to the fortunate stockholders are likely to be large, as the cost of delivering the ore on the cars, on account of the nearness of the tracks of the Pennsylvania Railroad, will be about one-half that of most of the mines in other parts of Warren County. The capital stock of the company is \$500,000.

ITEMS OF INTEREST.

A NEW variety of vermiculite, called Lucasite, has recently been described by Prof. Thos. M. Chatard.

PROF. CROOKES has discovered this year six new elements in the mineral species Gadolinite.

THE Russian Department of Commerce and Manufacture has awarded a patent to the inventor of a means of impregnating wood with a certain chemical, that, when dried, the matches from this prepared wood can be used several times over, thus effecting a saving of, it is claimed, at least 75 per cent.

M. FAVOL has ascertained that the absorption of atmospheric oxygen by coal dust usually produces the rise in temperature to which spontaneous combustion is due. Lignite is ignited at the low temperature of 300°, anthracite at 575°, and other varieties of coal in a powdered state, at intermediate temperatures.

M. FORDOZ gives a very simple and useful method for detecting lead in the tinning of culinary utensils. The vessel being carefully cleaned to remove grease, a drop of nitric acid is applied to any part, and a gentle heat is used to dry the spot. A drop of solution of iodide of potassium is applied to the spot; and, if lead be present, a yellow iodide of lead is formed.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART III.

PAUL'S MISHAP—LIST OF MINERALS.

At the word "Go" we all started on a run, the knowing ones making around the inclosure, and the others, of which there were six, making straight for it. The moment they clambered over the stone-wall the bull made for them. Four of them, seeing their danger, clambered back, but the other two, Paul M. and Henry W. L., started for the other side. It was now nip and tuck as to which should reach there first. Paul's hat was soon left behind in his vain endeavor to escape the bull which was now fast gaining on them. Henry, seeing that he could not escape the bull, suddenly dropped behind a rock, leaving Paul to face the furious beast, which dashed by him like a whirlwind, while he retraced his steps as fast as he could. Paul and the bull reached the other side so near together that it was hard to tell which reached there first. All we could see was Paul go over the fence like a shot, tumble head over heels, and roll to the bottom of the hill like a ball, while the bull complacently retraced his steps and amused himself eating up Paul's hat. We now hurried forward to see if he was hurt, and found him sitting on a rock rubbing his shins. All he would say was "I'll get square on you fellows before I go back." We helped him to the house and into the hammock, the privilege of which he had paid so dearly for. We hunted around the house and found him a hat, which, although it did not fit him as good as his own, had a brim on it large enough to prevent him from getting sunburnt.

To better enable us to recognize the minerals we were in search of, Harry D. had written out a short description of the minerals found at this place and vicinity. So, after supper, he read it to us for our information. It was as follows:

Franklinite.—Occurs with willemite and zincite. Is an iron-black mineral and is found massive, granular and in crystals. Hardness, 5.5-6.5. Streak dark reddish-brown. Luster metallic. Opaque. Brittle. Acts slightly on the magnet. Composition, Fe 66, Mn 16, Zn 17 = 99.

Willemite.—Silicate of zinc. Occurs with franklinite and zincite. Color whitish or greenish yellow when purest, apple-green, flesh-red, grayish-white and yellowish-brown. Streak uncolored. Transparent to opaque. Brittle. Massive, granular and crystallized. Hardness 5.5. Composition, Si 25, Fe .67, Mn. 2.66, Zn 71.33 = 99.66.

Troostite.—A crystallized willemite of a reddish-brown color. Generally found in calcite.

Zincite.—Red oxide of zinc. Occurs with Franklinite and calcite. Color deep red. Streak orange-yellow. Massive (foliated), granular and in crystals. Hardness 6. Translucent to subtranslucent. Composition, Zn 88, Mn 12 = 100.

Calamine.—Silicate of zinc. Color white. Crystallized, massive, stalactitic, botryoidal, and fibrous. Luster vitreous. Hardness 4.5-5. Pyroelectric. Occurs with smithsonite. Brittle. Transparent to translucent. Composition, Si. 26.23, Zn. 66.37, H. 7.40 = 100.

Fluorite.—Occurs in grains with franklinite and is of a deep purple color. Composition, CaF. 48.7, Ca. 51.3 = 100. Phosphorescent when slightly heated. Streak white.

Graphite.—Occurs in foliated scales in calcite at this locality.

Sussexite.—Occurs in fibrous seams or veins in franklinite, zincite and willemite. Color white, with a tinge of pink. Luster silky to pearly. Translucent. Hardness 3. Composition, boron trioxide 34.3, manganese protoxide 39.9, magnesia 16.9, water 8.9 = 100.

Rhodonite.—Bisilicate of manganese. Granular, massive and crystallized. Color flesh-red, brownish-red. Hardness 5.5 to 6.5. Streak white. Luster vitreous.

Calcite.—Occurs in rhombs of a delicate pink, rose and salmon color.

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year.....\$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch......50

Per Column.....2.75

Per Page.....5.00

Liberal discount on standing ads.

Nothing less than a half-inch ad. taken.

Advertisements must be in by the 20th, and exchanges by the 15th of the month to insure insertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

We have just received from Mr. Aron Hamburger three articles on Pennsylvania mineral localities, for which we return thanks. We hope some of our other subscribers will follow his example by sending us articles. If all will put their shoulder to the wheel we will be compelled to enlarge our Monthly.

MINERALOGISTS in New York and vicinity will be well repaid by paying a visit to the store of Mr. Wm. Niven, 739 Broadway, N. Y., as he has on exhibition a fine collection of cut goods, crystal balls, Herkimer quartz crystals, and rare minerals without number. All persons are free to examine his goods without fear of being asked to buy. He also has auction sales almost every month. Enclose stamp when writing for catalogue.

IN Algeria there is a small stream which the chemistry of nature has turned into true ink. It is formed by the union of two rivulets, one of which is very strongly impregnated with iron, while the other, meandering through a peat marsh, imbibes gallic acid. Letters have been written with this compound of iron and gallic acid which unite to form the little river.

→ HINTS ←

ALWAYS be on the alert to improve your collection.—T. S. ASH.

USE your specimens for study, not for ornaments.—T. S. ASH.

NEVER envy your fellowman's collection, but strive to equal it.—T. S. ASH.

A TELESCOPIC hard rubber drinking-cup comes handy at times to the collector—C. E. MASON.

MAKE every effort to keep yourself well posted upon the literature of your favorite studies.—T. S. ASH.

ALWAYS keep your specimens clean and well trimmed, otherwise half their beauty will be marred.—EDITOR.

IT is well to have several specimens of a kind, but from different localities. They are valuable for comparison.—C. E. MASON.

MANY minerals crystallize in several forms, or at least have different shapes and sizes, from being distorted or crushed together.—C. E. MASON.

NEVER label a specimen as coming from a certain locality unless you are sure it is the correct one. Better no locality at all than the wrong one.—EDITOR.

SPECIMENS for cabinet use should not be less than $2\frac{1}{2} \times 2\frac{1}{2}$ or 3×3 . It depends, however, on the size of the cabinet and the taste of the owner.—C. E. MASON.

WHEN starting out on a collecting tour, take a few pennies along. An offer to buy or a present of a cigar or two will often be followed by the disclosure of fine, rare and beautiful specimens.—C. E. MASON.

ALL specimens should be arranged in their respective orders, according to some good authority, and should be labeled with both scientific and common name, and the locality where found.—C. E. MASON.

To extract native copper from limestone and also to remove tarnish and brighten up specimen, put it in diluted hydrochloric acid until all the limestone or tarnish is removed. Then wash the specimen well in warm water and dry quickly before a fire or over a lamp.—EDITOR.

Exchanges

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

Old cents and old coins, dated after 1850, for arrowheads and V-nickels. MAURICE RANCH, Box 265, Parkersburg, W. Va.

Indian tomahawk, spearheads, grooved axe, and arrowheads, for coins of old dates. U. S. coins desired. H. T. UPSON, Parkersburg, W. Va.

Butterflies from Georgia to exchange for butterflies from the far Western States, or rare Eastern butterflies. ARNOLD F. RIEGGER, 275 E. N. Y. St., Indianapolis, Ind.

Fine arrowheads, minerals, and fossils to exchange for fine foreign stamps or U. S. cents back of 1825 or 1828. WILL T. MILLER, P. O. Box 45, Parkersburg, W. Va.

Will exchange books of all kinds for anything antique and curious, autographs, letters, etc. Send list of what you have with your price. BOOKS, 91 Dearborn St., Chicago, Ill.

A lot of birds' eggs, composing stick, 1200 blank cards, books, watch, and 100 old stamp papers, for type, coins, organette, rifle, telegraph instrument or offers. J. ALFRED, Lock Box 209, College Springs, Iowa.

Specimens of Iowa oolitic limestones to exchange for specimens of minerals, etc., also have sand and pebble specimens from the famous Belle Plume well for the same. W. A. ACKERMANN, Numismatist, Marengo, Iowa.

I will give 6 tin-tags for every stamp paper sent me. I would like to buy a collection of stamps cheap; but one having a collection to dispose of will do well to write me. GEORGE W. von UTASSY, Green St., Germantown, Pa.

I will give 20 well-mixed old U. S. or foreign stamps for every arrowhead, 35 of same for every spearhead, 50 for every Indian arrow, and 100 for every Indian tomahawk, pestle, or 2 axe-heads. RALPH MASON, Box 5, Mt. Holly, N. J.

90 numbers of "Harper's Weekly," value \$9.50, for a nickel watch (in good repair), printing press (chase 3x4), musical organette, or anything valued at \$3.00. All letters answered. List of articles to exchange free. F. S. GOLDSBURY, Box 4, Birre, Vt.

Will exchange illustrated books on the study of savage weapons, stone age, etc., Taxidermist Guide, giving full instructions for stuffing and mounting birds, animals, etc., illustrated, for grooved axes or offers in Indian relics. W. A. HAWKES, 125 Liberty St., Binghamton, N. Y.

A sea-urchin for a sea-gopher. A piece of copper ore for malachite 2x2 in. A star-fish and crystal for a mineral 2x2x2 or 2 V-nickels without the word cents. A piece of peacock ore, a smoky crystal, copper ore and star-fish, for a piece of tourmaline 2x2x2. C. R. NORTH, Chestnut Hill, Phila., Pa.

Tags to exchange in sets of 25 or more, Stamp papers, tag collectors' papers, "Youth's Companion," 150 postmarks for a V-nickel without the word cents. I will give 3 postmarks for every tin-tag, 7 different postmarks for every tag not in my collection. PHILIP A. CRAPO, 513 N. 6th St., Burlington, Iowa.

I offer 5 varieties of Western minerals, all different, for every Indian arrowhead, 10 for each spearhead or knife. These specimens are small, but very fine, and some extremely rare. Also 5 large handsome specimens of extra rare minerals for each Indian or Moundbuilder's pipe. Also want autographs, etc. J. T. DENNIS, Princess Anne, Md.

Fine minerals, fossils, shells, U. S. and foreign coins and stamps, to exchange for large and fine specimens only of minerals, English and English Colonial coins, Colonial and Continental paper money and newspapers in good condition dating before 1800. Correspondence promptly answered. J. E. G. YALDEN, The Rockingham, 56th St. & Broadway, New York City.

I want copies of a great many amateur stamp and natural history papers to complete my files. Especially want Empire State Philatelist, Stamp World, Sunny South Oologist, Young Oologist, West American Scientist, etc. Please send lists. Will exchange other papers or fossils, minerals, eggs, shells, etc., to 2 or 4 times value of papers. D. H. EATON, Woburn, Mass.

I will exchange a fine unused stamp, catalogued by Scott at \$1.00, for any one of the following coins: dimes, 1805, 1807, 1809, 1811, 1814, 1824, 1830 (with stars); half dimes, 1795, 1838 (no stars), 18 6, 1864, 1873; silver 3-ct. pieces, 1855, 1863, 1864, 1868, 1869, 1873; nickel 3-ct. pieces, 1877; 2-ct. pieces, 1872, 1873; cents, 1794, 1795, 1797, 1809, 1811, 1823, 1856 eagle nickel. All coins must be in from good to fine condition. THEO. C. BACON, Box 73, Middletown, Conn.

Wanted.—Relics such as old arms, viz., old guns and muskets, revolvers, pistols, swords, bayonets, hunting and bowie knives, spears, etc., no matter how old, rusty, or out of order, if they are whole and cheap. Also general curiosities, viz., corals, sea-shells, star-fishes, sea-urchins, alligators' teeth, sharks' teeth, skate-eggs, fossils, minerals, Indian stone-axes, spear and dartheads, pipes, or anything curious. Will exchange other specimens or pay cash when price is satisfactory. Correspondence solicited. GEO. F. MANNING, Box 295, Coshocton, Coshocton Co., O.

❖ Archaeology ❖

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

RELICS OF THE MOUND-BUILDERS.

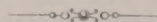
ANTIQUITIES OF WESTERN NEW YORK.

PART I.

THERE are in the vicinity of Randolph and other places in this country remarkable reminders of the mound-builders. Near the mouth of Cattaraugus Creek, for instance, there is a series of earthworks that extends to the Conewango Valley. Between Lake Erie and Dayton, in Chautauqua County, are the remains of a circular sepulchral mound which has an elevation of ten feet. It is 120 feet in circumference. According to antiquaries, this mound must have been the burying-place of some great warrior. In the towns of Lear and Conewango, some years ago, eight skeletons were found. They were in a sitting posture, and were arranged in a circle. Large blocks of mica were found in the mounds among the skeletons. Professor Lakin, of Randolph, who has given the subject much attention and study, is of the opinion that whatever people might have built these mounds, they must have regarded mica as a sacred substance, for in all the burial mounds that have been opened in Cattaraugus and Chautauqua Counties large blocks of mica have been found. As there are no deposits of that mineral in the region where the relics are unearthed, its presence has always been a mystery to scientists. One of these ancient mounds was opened in the village of Randolph. Three well-preserved skeletons of human beings who must have been of a race much larger in stature than ours, were found, each with a large block of mica, three inches thick and almost transparent, at its feet. On this mound a tree three feet in diameter was growing. The roots of the tree had pushed their way down into the ancient sepulchre and were entwined about the skeletons.

When the first white settler came into Cattaraugus and Conewango Valleys, upward of a century ago, the remains of numerous fortifications, sepulchres, hearths, and earth symbols were all well defined.

The most of these were leveled in time by the owners of the land, whose desire for utilizing the soil outweighed their interest in the preservation of the unwritten records of an extinct race. Relics in skeletons, pottery, implements, and weapons thus uncovered were fifty years ago common and unvalued portions of the garret litter of nearly every farm house in the region; but of late years they have been so drawn upon by collectors and antiquarians all over the country, that few of these reminders of the mysterious race are now among the possessions of the inhabitants. Professor Lakin has a notable collection at Randolph, probably one of the best in the United States.



The Nicaraguan Footprints.

GEOLOGICAL students will remember (says the London Times) that last year much interest was caused by the announcement that human footprints had been discovered in the solid rock in a quarry over Lake Managua, in the territory of Nicaragua. The interest was increased by the statement that those footprints had been overlaid by eleven different layers of stone, extending to a depth of four meters. This seemed to indicate an antiquity for our race quite transcending all conjectures hitherto hazarded. An Austrian gentleman, Herr H. E. Low, has obtained and forwarded to the Imperial Museum in Vienna, twelve large stone slabs bearing those footprints. They are about three-quarters of a meter square, and weigh altogether thirty-five centners. The footprints are very conspicuous, and seem to be those of three distinct persons, one of whom was a child. It is stated that in one of the overlaying strata impressions of leaves were very numerous and conspicuous. Unfortunately, no specimens of this have been forwarded to Vienna.

THE WHEATLEY MINE.

By F. J. LEWIS.

PART II.

THE crystallization of the cerrusite from this mine, is greatly varied, ranging from short, stout crystals, to broad, tabular plates, and of all the intermediate colors between grayish-black and white to colorless.

Twin crystals are a common occurrence.

The galenite shows a fine cubical cleavage, and contains, according to Genth, from ten to forty ounces of silver to the ton of ore.

I found but two crystals of galenite, but lost them again through carelessness. They were a combination of the cube and octahedron.

Those were the only ones I ever had from that mine.

Fine massive specimens of sphalerite (zinc blende) giving the dodecahedral cleavage are found here in abundance, also fine dodecahedral crystals and groups of crystals. One single crystal in my cabinet measures ten-sixteenths of an inch across.

Large rough, but perfect quartz crystals, are often found having a pink color, and rarely a bright crystal is turned up. There is also a good quantity of blue quartz near the mine, having the appearance of having been water-rolled.

Ankerite is found in great abundance, having on a fresh fracture a grayish-white color, but on the weather-beaten surface a fine bronze tarnish.

The appearance of this mineral can be improved by exposure to the weather until the bronze appearance is obtained.

White crystals of fluorite are found in fair specimens lining cavities, and as a coating on other minerals in cubes, truncated cubes, and groups having the appearance of a number of cubes pressed into each other but still retaining the original form.

Pyrite is rarely found in good crystals, three of which, five-eighths of an inch in diameter, are in my collection.

One massive specimen of pyrite from the Wheatley Mine is a pseudomorph after limonite.

When I first found the specimen it was about one-third limonite, but as the alteration still goes on there is less than one-sixth limonite.

Azurite occurs but rarely and in very small quantities. While the mine was being worked, crystals from one-fourth to one-half inch across were found.

Calcite being one of the gangues of the ore, there is of course, a large amount of it; six-sided prisms terminated with a three-sided pyramid are plentiful as hairs in boarding house butter. Scalenohedrons are more rare, as also the transparent spar.

Very small yellow and white globules of calamine, having a fibrous radiating interior, are in my possession, also a large mass having a botryoidal surface and divergent fibrous interior.

Quite a large amount of limonite has been turned out of the mine, but only in one instance did I find a specimen suitable for a cabinet.

[THE END.]

Process for Burning Diamonds.

THE process by which the chemist is enabled to burn the diamond, consists in introducing the stone, already heated to incandescence, into an atmosphere of oxygen. To effect this, the operator, holding the gem in a loop of platinum wire, projects against it the powerful flame of the oxy-hydrogen blow-pipe. By this means the stone is brought to a white heat, in which state it is quickly transferred to a jar containing oxygen. Active combustion at once ensues, continuing until the last atom of carbon contained in the diamond is changed into carbonic acid by its union with two atoms of oxygen. It is by measuring the amount of carbonic acid thus involved, that the true character of the diamond is determined, and its chemical identity to charcoal, graphite, and plumbago, established.

MINERALOGICAL CLUB

OF THE

NEW YORK ACADEMY OF SCIENCE.

THE third meeting of this Club was held on Tuesday, November 30, at the rooms of the Rutgers Female College, 58 W. 55th St., and proved as interesting as the preceding ones. The meeting was called to order with Prof. D. S. Martin in the chair and Mr. Kunz as secretary. After the reading of the minutes, it was proposed and carried that the organization of the Club be deferred for two or three months, and that a committee of five, consisting of Mr. Kunz, Prof. Martin, Mr. B. B. Chamberlain, Mr. W. A. Roebling, and Rev. R. T. Attlebury, be appointed to draw up such a constitution and by-laws as their observations of the meetings of the Club seem best. Power was also given them to secure a place for the Club's cabinet in such museum or institution as will give us space. In discussing the making of a complete catalogue of New York City minerals, Mr. B. B. Chamberlain informed us that he now had almost ready for publication, a catalogue of New York City minerals, consisting of 55 species, 110 varieties, and which would be illustrated by 100 engravings from his own pencil.

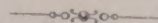
A pleasing feature of the meeting was the presentation of the first specimen for our collection by Mr. Wm. Niven. It consisted of a slab of gneiss with three groups of radiated tourmaline on it, looking like three large buttons laid on it. Prof. Martin had kindly arranged for our inspection a collection of Pseudomorphs from his own collection, and a collection of Geodes belonging to the college, and which were collected by Mr. Catlin, the great Indian writer and explorer, along the Upper Missouri, and purchased by the college from him. After partaking of refreshments the Club adjourned.

The next meeting will be the last Tuesday in December.

All mineralogists wishing to join this club should send their applications for membership to either Mr. George F. Kunz,

at Tiffany's, New York City; Mr. B. B. Chamberlain, 247 W. 125th St., New York City; or Prof. D. S. Martin, 236 W. 4th St., New York City.

All lovers of this science are invited to send in their applications.



WHAT WE KNOW ABOUT METEORS.

By GEORGE D. STORY.

THE luminous meteor tracks are in the upper part of the earth's atmosphere. Few, if any, appear at a height greater than 100 miles, and few are seen below a height of thirty miles from the earth's surface, except in rare cases where stones and iron fall to the ground. All these meteor tracks are caused by bodies which come into the air from without. The velocities of the meteors in the air are comparable with that of the earth in its orbit about the sun. It is not easy to determine the exact values of those velocities, yet they may be roughly stated as from 50 to 250 times the velocity of sound in the air, or of a cannon-ball. It is a necessary consequence of these velocities that the meteors move about the sun and not about the earth, as the controlling body. There are four comets related to four periodic star-showers, that come on the dates April 20, August 10, November 14, and November 27. The meteorides which have given us any one of these star-showers, constitute a path which is like that of the corresponding comet. The bodies are, however, now too far from one another to influence appreciably each other's motions. The meteorites of different falls differ from one another in their chemical composition, in their mineral forms, and in their tenacity. Yet through all these differences they have peculiar common properties, which distinguish them entirely from all terrestrial rocks. The most delicate researches have failed to detect any traces of organic life in meteorites.



MAGNESITE, burned and formed into magnesia stone, is a new substance for lining furnaces.

STAMPS! STAMPS!!

100 mixed foreign 3 c.
50 var. 4 c.

Sheets sent on approval to parties furnishing good reference, 25 to 50 per cent. cash commission. My stamps are marked lower than any other dealers. Address,

F. N. MASSOTH, JR.,
Hanover Center, Indiana.

NOTICE.

For ten cents in stamps we will send free by mail, a beautifully illustrated little work, giving full instructions for organizing and conducting writing schools, both in city and country, with many valuable hints for obtaining an elegant and at the same time rapid business-hand writing. The remarks on flourishing are unique and practical and will enable anyone to learn in a short time this beautiful accomplishment. Coming from the pen of so able a writer and so skilled a penman as Prof. E. K. Isaacs, it is not necessary for us to mention it farther.

Address the publisher, R. B. TROUSLOT, Valparaiso, Ind.

S. B. —Should you desire a copy of the HOOSIER NATURALIST, inclose additional stamps to the amount of 3 cents (13 in all).

60 No 2 alike chromo cards, no trash, with name on, only 10 cts. 12 hidden name, 10 cts. 25 assorted chromo, 10 cts. Agents wanted. STAR CARD CO., Box 219, College Springs, Iowa.

ROCKS!!

Amateur collections of 25 specimens, of moss agate, carnelian, banded agate, petrified "ool, actinolite, tourmaline, cryolite, galenite, fluorspar, chalcopryrite, oligoclase, stilbite, vermiculite, deweylite, selenite, cerussite, pyromorphite, apatite, brucite, blende, arsenopryrite, pyrrhotite, pyrite, quartz, wavellite.

Sent post-paid for 50 cts.

Sent by express for 35 cts.

T. J. LEWIS,

710 N. 22d St., - Phila., Pa.

RUBBER STAMPS.

1 to 5 lines for only 30 cents.

(Postage, 3 cents.)

This includes ink (any color) and pads, all in a neat box. Send for Illustrated Circulars. "Agents Wanted."

R. W. FORD, Bristol, Conn.

THE ARIZONA MINERAL COLLECTION.

PUT UP BY

MR. WILLIAM NIVEN,

Late Assistant-Commissioner, Arizona Territory,
World's Fair, New Orleans.

ONLY 50 CENTS A BOX.

This is the most attractive collection that has yet been put in the market, and should meet with a large sale. It consists of 12 specimens packed in cotton in a partitioned box, each accompanied by a printed list giving name of mineral, composition, etc., together with an engraving of the Natural Bridge, Chalcedony Park, Arizona Territory, which is made entirely of the wood of which this collection contains a piece. Each box contains:

FLUORITE,

FREE GOLD,

CHALCOCITE,

MALACHITE,

CHALCOPYRITE,

SMOKY QUARTZ,

NATIVE COPPER,

JASPERIZED WOOD,

AZURITE CRYSTALS,

CUPRITE ON LIMONITE,

ARGENTIFEROUS GALENA,

ARGENTIFEROUS QUARTZ.

For sale by

A. CHAMBERLAIN,

284 Pavonia Ave., Jersey City, N. J.

BEAUTIFUL MINERALS CHEAP.

Send for one of my descriptive price lists of the rare and handsome minerals of the famous mines of Jasper Co., Mo. Prices are the lowest. GEO. D. STORY, Carterville, Mo.

ADVERTISING RATES, 1 to 12 insertions.

| | 1 | 2 | 3 | 4 | 8 | 12 |
|---------------------|--------|--------|--------|--------|--------|--------|
| $\frac{1}{2}$ inch, | \$0.25 | \$0.40 | \$0.50 | \$0.60 | \$1.00 | \$1.40 |
| Inch, | .50 | .80 | 1.00 | 1.20 | 2.00 | 2.80 |
| $\frac{1}{4}$ page, | 1.50 | 2.25 | 2.85 | 3.25 | 4.75 | 6.00 |
| $\frac{1}{2}$ page, | 2.75 | 4.25 | 5.25 | 6.25 | 9.50 | 12.50 |
| Page, | 5.00 | 8.00 | 10.50 | 12.50 | 18.00 | 23.00 |



METEORITES

WILL PURCHASE OR TAKE IN EXCHANGE METEORITES FOR
FINE CRYSTALLIZED OR RARE MINERALS. INTACT FALLS. ALL THE
PIECES OF A FALL. AND NEW AND UNDESCRIBED METEORITES
ESPECIALLY DESIRED. ADDRESS,

GEORGE F. KUNZ, HOBOKEN, NEW JERSEY.

VOL. XX.

NO. 4.

FEBRUARY, 1887.

THE

Price, 3 cents.

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| THE OCCURRENCE AND FABRICATION OF ROCK CRYSTALS, - | 25 |
| ITEMS OF INTEREST, - - - - - | 26 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - - | 27 |
| EDITORIALS, - - - - - | 28 |
| HINTS, - - - - - | 28 |
| EXCHANGES, - - - - - | 29 |
| RELICS OF THE MOUND-BUILDERS, - - - - - | 30 |
| FOSSIL FLORA OF SAPOB, - - - - - | 30 |
| REPORT ON THE MINERALOGY OF GWYNEDD, PA., - - - | 31 |
| A NATURAL CURIOSITY, - - - - - | 31 |
| MINERALOGICAL CLUB OF THE N. Y. ACADEMY OF SCIENCE, - | 32 |
| ARCHÆOLOGICAL DISCOVERY IN ARKANSAS, - - - - - | 32 |
| A NATIVE ALLOY OF NICKEL AND IRON, - - - - - | 32 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.

WM. NYEN,

DEALER IN

FINE MINERAL SPECIMENS

AND

OBJECTS OF ART AND GENERAL USE

MADE FROM

JASPERIZED WOOD, LABRADORITE,

CROCIDOLITE, CARNELIAN, MOSS

AGATE, MALACHITE, ONYX,

RHODONITE, Etc., Etc.

A SPECIALTY MADE OF

JAPANESE CRYSTAL BALLS

OF ALL SIZES.

739 BROADWAY,

NEW YORK.

JOB PRINTING, POST-PAID
BY MAIL

100 Letter Heads, name and business on, 35 cents. Envelopes and Business Cards same price. 1000 Circulars, 4x6, \$1.50. 1000 Circulars 5x9, \$2. All job printing equally low. We make a Specialty of Job Printing for *Naturalists and collectors*. Papers or Magazines, Circulars, Price Lists, Labels, Data Blanks, etc. Send stamp for samples and prices. Our paper, THE PEOPLE'S PRESS, 25c. a year. R. M. RULISON, Flushing, Michigan.

NOTICE.

For ten cents in stamps we will send free by mail, a beautifully illustrated little work, giving full instructions for organizing and conducting writing schools, both in city and country, with many valuable hints for obtaining an elegant and at the same time rapid business hand writing. The remarks on flourishing are unique and practical and will enable anyone to learn in a short time this beautiful accomplishment. Coming from the pen of so able a writer and so skilled a penman as Prof. E. K. Isaacs, it is not necessary for us to mention it farther.

Address the publisher, R. B. TROUSLOT, Valparaiso, Ind.

N. B.—Should you desire a copy of the HOOSIER NATURALIST, inclose additional stamps to the amount of 3 cents (13 in all).

60

No 2 alike chromo cards, no trash, with name on, only 10 cts. 12 hidden name, 10 cts. 25 assorted chromo, 10 cts. Agents wanted STAR CARD CO., Box 209, College Springs, Iowa.

BEAUTIFUL MINERALS CHEAP.

Send for one of my descriptive price lists of the rare and handsome minerals of the famous mines of Jasper Co., Mo. Prices are the lowest. GEO. D. STORY, Carterville, Mo.

STAMPS! STAMPS!!

100 mixed foreign..... 3 c.
50 var., "..... 4 c.

Sheets sent on approval to parties furnishing good reference, 25 to 50 per cent cash commission. My stamps are marked lower than any other dealers. Address,

F. N. MASSOTH, Jr.,

Hanover Center, 1 Diana.

WANTED! Everybody to send 10 cents for the *Agents' World* four months on trial, and have their name inserted in the *Agents' Directory*, from which they will receive hundreds of samples, circulars, etc., and piles of good reading matter free. AGENTS' WORLD PUB. CO., Passumpsic, Vt.

10,000 **WANTED** 10,000

Subscribers.

Subscribers.

Every Poultry, Bee, Pet Stock Breeder, and everybody else who sends 15 cents for the POULTRY RECORD one year, we will insert an advertisement of 30 words FREE. Send at once. Address,

WILLIAM A. JONES,

Xenia, Ohio.

INDIAN ARROWHEADS

FOR

Cabinets and Collections.

Price List on receipt of a stamp. JOSEPH WIGGLESWORTH, Wilmington, Del.

N. Y. INFORMATION CO.,
693 Broadway, New York.

Letters with questions requiring research or written reply, should contain one or two dozen stamps, unless the writer has a credit with us by last report.

ADVERTISING RATES, 1 to 12 insertions.

| | 1 | 2 | 3 | 4 | 8 | 12 |
|------------------|--------|--------|--------|--------|--------|--------|
| ½ inch, line, | \$0.25 | \$0.40 | \$0.50 | \$0.60 | \$1.00 | \$1.40 |
| ¼ page, | 1.50 | 2.25 | 2.85 | 3.25 | 4.75 | 6.00 |
| ½ page, | 2.75 | 4.25 | 5.25 | 6.25 | 9.50 | 12.50 |
| Page, | 5.00 | 8.00 | 10.50 | 12.50 | 18.00 | 23.00 |

THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., FEBRUARY, 1887.

NO. 4.

THE OCCURRENCE AND FABRICATION OF ROCK CRYSTAL.

(FROM THE SCIENTIFIC AMERICAN.)

PART IV.

EVEN dealers themselves are frequently ignorant of what constitutes the expense of



JAPANESE CRYSTAL BALLS ON BRONZE STAND REPRESENTING WAVES.

crystal balls, and state that it is the labor and skill required in their cutting, instead of the rarity of the material employed. Mr. Kunz has had occasion to visit almost all the public and private collections in this country, and to write hundreds of letters of inquiry on the subject of American gems and gem minerals, yet he failed to learn of any masses of rock crystal in the United States that would produce a perfect three inch ball.

There were several pieces that would have afforded balls from three to four inches in diameter, but they were so filled

with veinings that the material was used for other purposes. The rarity of large masses of pure crystal is such that a well-known dealer has a standing offer open of \$1,000 for a five inch crystal ball, \$1,500 for one of five and a half inches, and \$4,000 for a seven inch ball.

Messrs. Tiffany & Co. have very recently come into possession of a magnificent mass of rock crystal which will probably afford the material for a five inch ball. It comes from a new American locality, and is apparently without blemish.

Among the imperfections which unfit so



RUSSIAN CRYSTAL VASE.

much of the rock crystal for the purpose of manufacture are seams, inclusions of other minerals, and cavities filled with liquid. In addition to these there is the

bulb of concussion, as it is termed, produced when a mass of crystal receives a sharp blow. These may be seen in any agate mortar which has been extensively used in the laboratory. A perfect funnel-shaped flaw is produced, and is apt to become further developed if an attempt is made to work the crystal.

Viewed as works of art, however, the cups, vases, and pitchers of crystal made during the 16th and 17th centuries at the Louvre, Dresden Green Vaults, and Shatz Kammer at Vienna, are immensely superior to the simple crystal balls. Two pieces of this class, recent Viennese reproductions, were formerly in the Morgan collection. They are in the shape of dishes, and measure from 4 to 6 inches across. They are beautifully engraved in intaglio, and mounted in silver and gems. One of the most notable of these objects in the United States is now in possession of Messrs. Tiffany & Co. It is a circular disk of $9\frac{1}{4}$ inches in diameter, on which the Finding of Moses has been beautifully cut in intaglio. Shortly after its completion, this remarkable piece of crystal was unfortunately dropped by the engraver, and is now in two pieces, but even in its mutilated condition it is an admirable work of art. Another piece of good carving and beautifully clear crystal, in the possession of the same firm, is a solid crystal vase of Russian workmanship, 5 inches high and about 3.25 inches broad. Still another is a small crystal vase in the shape of two crystal balls, one resting on top of the other, and is an ingenious piece of work, both balls having been hollowed out from the one opening in the end. The rock crystal itself is full of delicate acicular crystals of hornblende. One of the finest pieces of work in European cabinets is an urn 9.5 inches in diameter and 9 inches high. The entire object, including the pedestal, is made of one piece of rock crystal, the upper part being handsomely engraved. Its cost was about \$20,000.

The Japanese have a favorite proverb, "Until polished, the precious gem has no splendor," which will be appreciated when a rough fragment of rock crystal is compared with a finely polished ball; but the

fact remains that its real value lies beneath the labor and beneath the polish, in the crystal itself.

[THE END.]

ITEMS OF INTEREST.

AN extensive deposit of pure asphaltum has been discovered near Thistle Station, in Utah. It is worth \$40 a ton; the expense of mining is about 40 cents.

C. WELSH (Chemical News, 54-94-95-162), has found in fourteen analyses of Embolite from various localities, the amount of silver chloride to vary from 20 to 82 per cent.

A BIG NUGGET.—A gold nugget weighing thirty-five pounds and valued at \$6,000 is on exhibition in San Francisco. It was found in the northeastern part of the State and is the largest and finest ever unearthed.

A. B. GRIFFITH and S. Dreyfus (Chemical News, 54-67), has examined Calamine from the southwestern parts of Siberia, associated with barium sulphate and galena in a matrix of limestone. It is found in right rhombic prisms belonging to the prismatic system; hardness 5 to 6; sp. gr. 4.629; comp. Zn 50.03, Fe 2.77, Cd 0.92, Mn 0.12, SiO₂ 5.62, Co₂ 35.21, H₂O 5.33. Calamine when found crystalline has hitherto been in the form of rhombohedrons, so that it would appear to be dimorphous and isomorphous with calcite and aragonite.

A NEW MINERAL.—Ptilolite occurs in cavities of an augite-andesite in the conglomerate beds of Green and Table Mountains, Colo. It occurs in most delicate white tufts and spongy masses composed of short, hair-like needles, loosely grouped together. Examined under the microscope these needles are found to be colorless, transparent prisms, the average diameter of which is less than 0.001 mm. An analysis yielded: SiO₂ 70.35, Al₂O₃ 11.90, CaO 3.87, Na₂O 0.77, H₂O 10.18 = 99.90. The substance belongs to the aluminosilicates, of which no previously described hydrate contains so high a percentage of silica.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART IV.

LIST OF MINERALS—DESCRIPTION OF THE TAYLOR MINE.

JEFFERSONITE.—Manganese-zinc Pyroxene. Occurs massive and in crystals with angles rounded and faces uneven and generally of a corroded appearance. Color greenish-black. Contains lime, magnesia, protoxyd of iron and protoxyd of manganese, with oxyd of zinc.

Chondrodite.—Occurs with calcite. Massive, granular and crystallized. Color honey-yellow. Subtranslucent. Hardness 6-6.5. Luster vitreous to resinous.

TEPHROITE.—Occurs with zincite, willemitite and franklinite in cleavable masses. Color grayish, flesh-red, reddish-brown and ash-gray. Comp., Si 28.66, Fe 2.92, Mn 68.66 = 100.43. Hardness, 5.5 6. Luster adamantine.

Besides these minerals the following are occasionally found: Spinel, garnet, dysluite, scapolite, tourmaline, epidote, mica, actinolite, beryl, galena, sphene, amethyst, zircon, molybdenite, vivianite, aragonite, rhodochrosite and ulgarite.

Before Harry D. finished reading his list of minerals, we received a letter from Mr. W. W. Pierce, Supt. of the Taylor Mine, at Mine Hill, inviting us to come over and inspect the mine on the morrow, which we decided to accept.

As it was now getting late we all retired to our rooms and were soon fast asleep and dreaming about the rich finds there was in store for us on the morrow. For fear of more practical jokes nobody volunteered to sleep in the hammock.

To most of us it did not seem more than two hours before we heard the farmer ringing a huge bell to inform us it was five o'clock and time to get up, and for once in our lives we rolled immediately out of bed, and long before the breakfast bell rung, which was at six o'clock, we were all

dressed and out enjoying the delightful morning air.

As soon as breakfast was over we secured our tools and satchels and started for Mine Hill, which was only about a mile away. Here we found the miners just getting to work, but as the Supt. was not expected for an hour, we thought we would walk about and inspect the exterior of the mine.

The Taylor Mine, formerly known as the Buckwheat, is situated on Mine Hill, about 1000 feet from the depot at Franklin and the same distance from Franklin Furnace, where a good part of the ore is reduced, the rest being sent to Jersey City, Newark, and Bethlehem, Pa. The hill itself is a couple of miles in circumference, is overgrown with trees, and here and there are found abandoned shafts and at one place a cool spring of water. By the time we had made the circumference of the hill it was long past the hour for Mr. Pierce to arrive, so we repaired to his office near the entrance to the mine, and found him awaiting us. He gave us a hearty welcome and soon had us fixed out with lights, etc., for our trip.

The main shaft of the mine, instead of going down into the bowels of the earth, was on a level with the office and led us into the side of the hill. It was from 40 to 50 feet wide, which was the width of the vein. After going about a hundred feet along this shaft we found other shafts branching off, some to the left, and others deeper down into the hill. He informed us that no limit had as yet been found either as to the depth or the limit of the deposit.

The ore is mined on the same principle as at most other mines, that is, first blasted, then broken into smaller pieces and loaded on small cars, which are run to the entrance and either loaded on larger cars or run down to Franklin Furnace. After watching the men at work for a while we retraced our steps to the office. He now showed us a number of fine specimens that had been taken from the mine, most of which were crystallized. He also gave us the following description of the early history of the mine.

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year..... \$.25

ADVERTISING RATES.

| | |
|--------------------|--------|
| Per Half Inch..... | \$.25 |
| Per Inch..... | .50 |
| Per Column..... | 2.75 |
| Per Page..... | 5.00 |

Liberal discount on standing ads.

Nothing less than a half-inch ad. taken.

Advertisements must be in by the 20th, and exchanges by the 15th of the month to insure insertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

If there is one thing more than another which is apt to make us proud of our Monthly, it is the interest which our subscribers take in it. In answer to our editorial asking for articles on mineral localities in their vicinity, we have received a score or more of articles. We have also received an overwhelming number of exchange notices, a number of which we had to leave over for want of room.

THE well known curiosity and mineral dealer, Mr. F. A. Thomas, will on the first of next March make another addition to amateur journalism in the shape of a twelve-page paper called "Common Sense." Well, go ahead Mr. Thomas, make it worthy of its name and it will be a success. Note his offer on another page.

A PSEUDOMORPH of limonite after pyrite, recently found in Baltimore Co., Md., contains six of the seven possible crystallographic forms of the regular system. The forms actually observed are: O , ∞O , $\frac{1}{2} \times O_2$, $\frac{1}{2} \times 4O_2$, $2O_2$, $3O$, are developed in each octant, imparts to the crystal an orthorhombic symmetry.

HINTS

KEEP a full correct record of all your specimens. — T. S. ASH.

MINERAL specimens are the flowers of the mineral kingdom. — T. S. ASH.

PARAFFINE is a good material for lubricating the stoppers of bottles containing caustic alkali. — T. S. ASH.

ROCK, Latin *rupica*, from *rupes*, a rock. A large mass or natural deposit of stony matter. — C. E. MASON.

A FEW drops of oil of cloves, put on mucilage will prevent it from souring, salicylic acid possesses also the same property. — T. S. ASH.

MINERAL, from Latin *minerales*, this in part from *minare*, to drive or dig after. Any inorganic substance having a definite chemical composition. — C. E. MASON.

METAL, from Latin *metallum*, a substance having a peculiar luster, a good conductor of heat and electricity, and usually solid at ordinary temperatures. — C. E. MASON.

GUTTAPERCHA dissolved in chloroform makes the most valuable cement for collectors in all branches, as it sticks to everything, never scales, never discolors minerals, is flexible and dries in half a minute. — W. W. DOUGLAS.

DURING the long winter months when one is compelled by the cold to stay at home, cabinets and collections should be overhauled, duplicates taken out, a catalogue of them made, and then they may be laid away for swelling the exchange list, and everything made ready for the expected summer trumps and rambles. — C. E. MASON.

THE best charcoal for blowpipe examinations is a dry, well-burned, soft wood, to be cut out in rectangular blocks, about 6 in. long, 1½ in. wide and ¾ in. thick, having its flat smooth surface at right angles to the rings of growth in the tree. Each piece should be tested before the blowpipe flame in order that one may not imagine a deposit of ash to be an incrustation derived from the substance under examination. — T. S. ASH.

✧ Exchanges ✧

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

I have Indiana Geological Reports to exchange for other State Reports or fine fossils or minerals. G. K. GREENE, New Albany, Ind.

Will exchange a fine rare specimen of coprolite for a dime dated before 1875. Cabinet size. J. G. WAINWRIGHT, Waukegan, Ill.

Any amount of asbestos for the best offer of coins, minerals, birds' eggs or offers. No postals answered. WM J. BUCKLEY, 125 Greenwich St., New York City.

I will give a handsome watch-charm for three V-nickels or best offer of old coins. G. C. HILL, care of Reed Button-hole Machine Co., 458 Harrison Ave., Boston, Mass.

I have Spanish coins, dated from 1812 to 1809, and other old coins dated after 1831, for arrowheads and grooved axes. MAURICE RANCH, Box 265, Parkersburg, W. Va.

Pamphlet called "Pocket Manual of Coins," for any dime before 1875, half-dime before 1836, or cent before 1815, good condition. C. T. TATMAN, 93 Piedmont Street, Worcester, Mass.

Will exchange books of all kinds for anything antique and curious, autographs, letters, etc. Send list of what you have with your price. BOOKS, 91 Dearborn St., Chicago, Ill.

A fine Indian arrowhead, suitable to wear on a watch-chain, a beauty, for every cent dated before 1816. Persons having coins will do well to send me list. H. T. UPSON, Parkersburg, W. Va.

I will exchange minerals and cabinet specimens for the same from other States. Write first, or forward and receive as many in return. HUGHES McDONALD, Box 42, Simpson's Store, Washington Co., Pa.

I will give 50 rare stamps for every Indian arrowhead sent me, or 3 rare minerals for every one not in my collection. Send for list of minerals, birds' eggs, etc. FRED. H. BLANCHARD, Tunbridge, Vt.

I will exchange minerals and cabinet specimens for shells or curiosities. Shells and minerals preferred. Write first, or forward and receive as many in return. MARY M. SPROWLS, Box 4, Simpson's Store, Washington Co., Pa.

A wholesale dealers' stock of postage stamps, suitable for the approval-sheet business, many desirable varieties and valued at \$12, for type, printing material, type-writer, rifle, organette, telegraph instruments or coins. J. A. ANDERZEN, JR., College Springs, Iowa.

I will give two advertising cards for every silk, velvet or plush piece for crazy work. All letters answered. HATTIE COFFELT, Ontario, Story Co., Iowa.

Buhrstone from France, molybdena (native disulphide of molybdenum) in blue calcite, rare, kyanite, red hematite from Cape Palma, Liberia, a bull's-eye lantern, small, complete with lamp, etc., for minerals, of which send list. ARON HAMBURGER, Box 1, North Wales, Pa.

I will give 800 U. S. and foreign stamps and one game of authors and directions how to use them, for the most stamps not in my collection. Send sheets for exchange and I will send mine. I will also give a large fine shell for fine stamps not in my collection. W. A. T. MANSFIELD, Cat Creek, Powell Co., Ky.

I have varieties of R. I. white limestone, fine samples of the ornamental iron ore termed menaccanite, and actinolite penetrating limpid quartz and tale, which I will exchange for minerals and fossils. Also Virginia crinoidal rock stems and buds, views in Yellowstone Park and a lot of old U. S. coppers. J. R. WATERMAN, Woonsocket, R. I.

Rare foreign stamps and U. S. revenues to exchange for large, fine spec. of minerals. Would also like coins, medals, arrowheads (perfect), and alligator's teeth. Send lists of articles you have to exchange, with valuation, and list of wants. I have also spec. of conglomerate, any size, to exchange. W. P. YOUNG, Pond St., Jamaica Plains, Mass.

Lilac scapolite, scapolite crystals, nuttallite, boltonite, diopside, sahite, fetid limestone, serpentine in calcite (yellow), wine-colored calcite, cinnamon garnet, chiastolites, spodumene, sterlingite and allanite in calcite, Bolton, Roxboro and Sterling, Mass., minerals in exchange for cabinet-size specimens from all localities. Lists for exchange desired. G. L. BRIGHAM, Bolton, Mass.

I have 100 sea curios, 100 shells, 35 birds' eggs, \$2.50 Oologists' supplies, small stamp album and 200 stamps, vol. "Youth's Companion," 50 minerals, Davies Egg Check List, and a small telescope. I will exchange them all for a telescope or Coues Key, or a printing press, or a part of Vol. XIII, "St. Nicholas," or books on Natural History, or best offer in stamps. GEO. M. ELLISON, 16 Sumner St., Lynn, Mass.

A velocipede suitable for a boy of fourteen and Vol. VII of "Golden Days" for a printing-press, relics or offers. I will send a brand new copy of Dicken's "Pickwick Papers" for every 10 special delivery or 15 department stamps. Also, I will send recipes for making all the following: sealing-wax, cologne, shoe-blackening, mucilage and inks (black, red, invisible and indelible), to those sending me anything worth 25 cts. JAS. R. FLANAGAN, 11 Malden St., Boston, Mass.

❖ Archæology ❖

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

RELICS OF THE MOUND-BUILDERS.

ANTIQUITIES OF WESTERN NEW YORK.

PART II.

ALTHOUGH some of the most important relics of the mound-builders' era in this region have been obliterated, there are many still in such preservation as to present an intelligent and interesting record to the antiquary. A specially interesting relic of that age is an earth formation near the New York, Pennsylvania and Ohio Railroad station in Randolph. According to those who have read the customs of the mound-builders by the monuments they have left, this was fashioned thousands of years ago and was designed to represent a serpent.

The formation is 425 feet long and enthusiastic antiquaries who visit it are unanimous in declaring its unmistakable resemblance to a huge snake basking in the sun. The farmer on whose property this symbol is, was ploughing around what the antiquaries say is the head of the serpent a few years ago. Near that extremity stood the stump of what had been a large pine tree which tradition says was fallen with age when the place was settled. The stump was over three feet in circumference and its presence on the mound was unmistakable evidence of the great age of the earth work. The farmer ploughed so close to the end of the mound that his ploughshare caught in a projecting root of the old stump. The earth was raised for a foot or more beneath it, uncovering a number of stone spearheads of a pattern and finish that showed workmanship much superior to that by which the later flint arrows of the Indians were fashioned.

The mound was explored for a short distance and nearly two hundred of spear and arrow points were found all heaped to-

gether in one spot. Several stone axes, polished and symmetrical, and many fine specimens of block mica were also uncovered. There are over two hundred feet of the mound which have never been disturbed.

Other excavations made near Randolph have revealed roomy mica-lined cells, some containing large quantities of parched corn in excellent preservation. Around some of these singular tumuli deep and wide ditches had been dug by ancient workmen.

Professor Lakin has traced these relics of the mound-builders from Randolph down the Allegheny to the Ohio River, and westward as far as Lake Superior and then into Wisconsin. There the most remarkable mounds on the continent were found. Antiquaries outline distinct effigies of animals, six parallelograms, one great circle, and an immense effigy of the human figure. The mastodon is one of the animals outlined, and this, taken in connection with the fact that the remains of this extinct monster have been unearthed in all of the localities where the mounds are found, has led Professor Lakin and other antiquaries to advocate the theory that the mound-builders made the mastodon subject to their will; that they made of it a beast of draft and burden, both in peace and war, as the horse and elephant are utilized to-day. Remains of the largest mastodon ever discovered have been found in the Conewango Valley, but no complete skeletons were ever collected.

[THE END.]

A paper on the fossil flora of Sapor, in Carniola, has been prepared by Baron von Ettingshausen. It states that the great diversity of the fossil plants showed that the tertiary flora of Sapor and other localities must be considered the origin of all the living floras of the globe; for in the fossil floras of Sapor are found plants representative of forms now found in Australia, North America, Chili, India and the East India Islands, Europe, Africa, Norfolk Islands, and New Zealand.

REPORT ON THE MINERALOGY OF GWYNEDD, PA.

By ARON HAMBURGER.

In the vicinity of Gwynedd, Pa., many mineral species occur in the rocks of the various formations, which are principally limestone and shale.

Many rarities have also been obtained here in small quantities. Notable among these are molybdenum, of which were found a large specimen a year ago, and erubescite, or horseflesh copper, several fine specimens of which were brought to us from a Gwynedd farm by a workman, who constantly spoke of the pretty stones which could be found there. These specimens of erubescite contained about ninety per cent. of pure sulphate of copper. The molybdenum was found in blue calcite in a lump weighing about forty pounds.

Since that time we have sent specimens of it to all parts of the United States.

Magnetite, which contained about ninety per cent. of iron oxide, was found at the erubescite locality.

Pink, white, grey and red feldspars are found in abundance near Gwynedd.

Calcite, massive and crystallized in a clear round pill-like form, nail-head and dog-tooth spars, garnetiferous mica schist, richly warted with garnets, have been found in Gwynedd.

Dendrite (forest rock), marked with beautifully shaped trees, occurs between layers of shale.

Quartz in many varieties is found, and beautiful specimens of coal on feldspar are obtained above Gwynedd.

Flint of many colors, and arrowheads made from it, are plowed up on the various farms.

Space will hardly allow an elaborate description of the mineralogy of this township, so we have been as brief as possible in our descriptions.

Traces of lead and iron have been discovered by us in the borough of North Wales, and beautiful pyrites, crystallized and massive, have also been found.

Mr. W. H. Taylor, President of the North

Wales (Penna.) Agassiz Chapter, has reported the finding of a twinned crystal of green calcite above the Gwynedd tunnel, on the North Penna. R.R.

Sulphur diffused through the rocks which are frequently blasted up, indicate a probable volcanic upheaval in the early geological history of this section.

This abundance of mineralogical species makes it a very interesting and instructive locality for the young mineralogist.

Inquiries about the minerals of this locality will be cheerfully answered by us, and we will be pleased to exchange specimens from this locality for others.

A NATURAL CURIOSITY.

By CHARLES E. MASON.

At Cederville, Cumberland Co., N. J., while digging in a bed of glass-sand belonging to Mr. Wm. O. Garrison, specimens of natural glass were found. In appearance they were like fine tubes, varying from 1-32 to $\frac{1}{8}$ inch in diameter, having on the inside a distinct glaze like fused glass, and on the outside being rough and covered with sand. This was found at a depth of from 5 to 9 feet. As glass-sand, which is composed mostly of SiO_2 , is not melted without a flux, except by intense heat, it is supposed that at one time a tree growing above was struck by lightning, and the electricity not being discharged fast enough by the roots, the current descended to the smaller rootlets, and passing directly to the sand, melted it.

Branches and forks similar to those of small roots help along this supposition.

The various colors in turquoise is probably due to copper oxide, CuO , and the presence of iron tends to give a greenish tinge to the mineral.

In one of the French schools there is a natural magnet which is capable of lifting four times its own weight.

MINERALOGICAL CLUB

OF THE

NEW YORK ACADEMY OF SCIENCE.

THE fourth meeting of this Club was held at the residence of Mr. J. B. Amend, 120 E. Nineteenth St., on Tuesday evening, Dec. 28th. These meetings are proving of great interest and the attendance at them is gradually increasing. Mr. Amend had arranged for our inspection a number of interesting specimens, among them some very beautiful epidotes from the Tyrol.

Mr. Bjerreguard exhibited some green and blue tourmalines from New York City, Mr. Kunz a piece of a new meteorite from Kentucky containing olivine, Mr. B. B. Chamberlain a moonstone from Tarrytown, N. Y., and a crystallized dolomite which came also from the same place, and Mr. Hidden a meteorite weighing twelve pounds from Nash Co., N. C., also some cut Hiddenites from N. C., an emerald green crystallized spodumene, which was named after him.

Mr. Kunz and Mr. Hidden gave us some interesting facts about meteorites and their composition, and after the meeting Mr. Amend invited all to partake of a splendid collation which he set before them, and which was enjoyed by all.

Among those present were Mr. Geo. F. Kunz, Prof. D. S. Martin, Mr. B. B. Chamberlain, Prof. C. S. Stone, Mr. W. A. Roebling, Mr. W. E. Hidden, Mr. Braun, Mr. Wm. Niven, and Mr. A. A. Cary.

All mineralogists wishing to join this club should send their applications for membership to either Mr. George F. Kunz, at Tiffany's, New York City; Mr. B. B. Chamberlain, 247 W. 125th St., New York City; or Prof. D. S. Martin, 236 W. 4th St., New York City.

All lovers of this science are invited to send in their applications for membership.



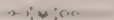
MASSIVE quartz crystals have been found in one of the iron pits on Iron Hill, New-castle Co., Delaware.

Archæological Discovery in Arkansas.

By JOSEPH WIGGLESWORTH.

WHILE plowing in a field in Faulkner Co., Arkansas, Geo. Smith saw a ravine which had been washed by a recent overflow of the Black Fork, and in which reposed a large number of skeletons lying in a natural position, together with several earthen bowls, shells, arrows, etc. The skulls were all incased in vessels made of clay, while one, with handsomely engraved ornaments, denoted that the skull belonged to some unusually important personage.

The farm has been under cultivation over forty years, and relics denoting the existence there at one time of a prehistoric race have been frequently found.



A NATIVE ALLOY OF NICKEL AND IRON.—Prof. Ulrich of Dunedin, New Zealand, has recently discovered in the interior of the South Island, of New Zealand, a range of mountains composed of olivine-enstatite rock, in places converted into serpentine. The sand of the rivers flowing from these rocks contains metallic particles, which an analysis prove to be an alloy of nickel and iron in the proportion of two atoms of the former metal to one of the latter. Similar particles have been detected in the serpentine. This alloy, though new as a native terrestrial product, is identical with the substance of the Oktibba meteorite, which has been called Oktibbehite.



SOME of the clearest hyoprobe garnets to be found in the world, are found in the bed of Green's Creek, a small stream which flows across the lower part of Delaware Co. The garnets are usually about the size of a small pea.



A LARGE cave has been recently discovered in the Oregon Range, forty miles north of El Paso, which in size and in the beauty of its stalactites and stalagmites, bids fair to rival the Mammoth Cave.

AND

P. O. BOX 34, GUADALAJARA, MEXICO.

◆ ◆ ◆

Any specimens from the following price-list are sent by mail post-paid.

| | | | |
|-------------------------|---------------|-----------------------------------|---------------|
| Analcite..... | \$0.10 to .50 | Graphite..... | \$0.10 to .30 |
| Alunogen..... | .10 to .20 | Gypsum, xls..... | .50 to 1.00 |
| Amethyst..... | .05 to .50 | Silin spar..... | .05 to .25 |
| Amethystus..... | .05 to .20 | Selenite..... | .05 to .25 |
| Andalusite..... | .20 to 1.00 | Hematite..... | .05 to .50 |
| Anglesite..... | .20 to 1.50 | Heu audite..... | .30 to 1.50 |
| Antimony..... | .10 to 1.00 | Idocrase..... | .10 to .30 |
| Apatite..... | .15 to 2.00 | Lazulite..... | .50 to 2.00 |
| Apophyllite..... | 1.00 to 3.00 | Lepidolite..... | .15 to .30 |
| Argentite..... | .50 to 1.50 | Limonite..... | .05 to .50 |
| Asphaltum..... | .03 to .20 | Magnetic pyrites..... | .15 to .30 |
| Autunite..... | .15 to .50 | Magnetic sand (titaniferous)..... | .05 |
| Azurite..... | .10 to 4.00 | Magnetite..... | .05 to .30 |
| Barite..... | .05 to 1.00 | Malachite..... | .10 to 1.00 |
| Beryl..... | .10 to .50 | Margarite..... | .25 to .50 |
| Biotite..... | .15 to .50 | Menaccanite..... | .30 to .60 |
| Bismuth..... | .15 to .50 | Mesolite..... | .25 to 1.00 |
| Blende..... | .10 to 1.00 | Mispickel..... | .10 to .25 |
| Bornite..... | .05 to .50 | Molybdenite..... | .15 to 1.00 |
| Calcite, xls..... | .25 to 1.00 | Natron..... | .05 to .15 |
| Calc spur..... | .05 to .15 | Obsidian (fine shades)..... | .05 to .20 |
| Mex onyx..... | .05 | Opal, precious..... | 1.00 to 5.00 |
| Do. pol. onyx..... | .20 | Opal, milky..... | .10 to .50 |
| Do. pol. object..... | .50 to 3.00 | Opal, Hyalite..... | .50 to 1.00 |
| Cancrinite..... | .10 to .50 | Opal, semiopal (dif. shades)..... | .05 to .30 |
| Carnelian..... | .10 to .50 | Onyx-opal..... | .15 to 1.00 |
| Cassiterite..... | .10 to 1.00 | Onyx (quartz)..... | .10 to .50 |
| Celestine..... | .25 to 1.00 | Pheinite..... | .15 to 1.00 |
| Cerargyrite..... | 1.00 | Psilomelane..... | .05 to .20 |
| Cerussite..... | .25 to .50 | Pyargyrite..... | .50 to 3.00 |
| Chalcedony..... | .10 to .50 | Pyrite..... | .10 to 1.00 |
| Chalcocite..... | .10 to 1.50 | Pyrolusite..... | .10 to .50 |
| Chalcopyrite..... | .05 to .50 | Quartz, xls..... | .05 to 1.00 |
| Chrysocolla..... | .15 to .50 | Quartz, Jasper..... | .05 to .20 |
| Chrysolite..... | .05 to .60 | Quartz, Silicified Wood..... | .10 to .50 |
| Cinnabar..... | .30 to 1.50 | Rhodonite..... | .10 to 1.00 |
| Columbite (Niobit)..... | .10 to 2.50 | Rubellite..... | .15 to .50 |
| Copper..... | .10 to 2.00 | Silver..... | .25 to 1.50 |
| Corundum..... | .25 to 1.00 | Sodalite..... | .15 to .50 |
| Crocidolite..... | .75 | Sphene..... | .15 to 1.00 |
| Crocoite..... | 1.00 | Sulphur..... | .05 to .20 |
| Cryolite..... | .15 to .50 | Trydumite..... | .30 to 1.00 |
| Cuprite..... | .20 to 2.00 | Triplite..... | .15 to .50 |
| Cyanite..... | .10 to .30 | Vivianite..... | .10 to .40 |
| Fluorite..... | .05 to 1.00 | Wad..... | .05 to .50 |
| Galenite..... | .05 to .50 | Zircon..... | .05 to 1.00 |
| Gold..... | .50 to 1.00 | | |

Address.

LANDERO & CO., ENGINEERS.

P. O. BOX 34, GUADALAJARA, MEXICO.



THE Corona NEWS-LETTER

contains Mathematical Problems and Puzzles, Specimens of Modern Job Printing, Sketches of Life in a New York Printing Office, etc. Try the "Cat Problem," the "Steamer Problem," Judge Duffy's Quadratics, etc. Issued every 2 weeks, 50 cents a year—Sample, 2 cts.

Address NEWS-LETTER, Corona, Bergen Co., N. J.

A SAMPLE SELF-INKING STAMP which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc., all mailed free for 50 cts. (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

WE GUARANTEE YOU TO RECEIVE 500 Samples Books, Circulars, Letters and Papers **FREE** from firms all over the U. S. and Canadas if you send 20 cents to have your name in new issue of **AGENTS' NAME DIRECTORY**. Copy sent you with name inserted

VERNON HILL, VA., Dec 27, '86.

ALLEN & CO., GENTS:—I have already received more than the 50 parcels of mail, many Newspapers, etc., of which I had often paid 10c. each before. I advise all to have their name inserted at once. I know from experience your directory far excels all others.

R T JAMES, Agent

ALLEN & CO., Box 308, Kennedy, N. Y.

COLLECTORS.—8 sea shells, a specimen each of petrified wood and leaves, and a nice sea curiosity mailed to any address for 15c. Send stamp for price list

ELLIS D. ROBB, Eldora, Iowa.

STAMPS! STAMPS!

50 different. Bulgaria, Brazil Confederate States, Finland, Tasmania Natal Luxemburg, &c. Price 20 cents. J. E. H. REIMAN, 1435 State St. Chicago, Ill.

"COMMON SENSE"

Is the name of a large 12-page paper to be published March 1st, 1887. It will be devoted to Minerals, Stamps, Coins, Relics, etc. As its name indicates, there will be nothing but good sound reading and a few advertisements of old and reliable dealers. The Subscription price is but **25 Cents per Year**. Or to all who send **15 Cents before March 1st**, will receive paper 1 year. Dealers try an Advertisement. 40 Cents per Inch. 2000 copies first issue.

F. A. THOMAS, Editor,
Mexico, N. Y.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of STAR RIDERS and Cyclists in General.

E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE**, East Rochester, N. H.

Make Money Orders and Drafts payable to E. H. CORSON.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.

FOR SALE CHEAP.

Fine Indian Pipes, Stone and Flint Tools, Minerals, Fossil Ferns, Mounted Birds, Books, and Fine Fossil Fish. List for Stamp.

O. D. WALLBRIDGE, Marseilles, Ill.

PHOTOS FOR GENTS ONLY. Sure to suit. 2 for 10c., 6 for 25c., 12 for 40c. Address, F. G. OSGOOD,

Ann Arbor, Mich.

35 RARE CURIOSITIES, such as Perfumed Palestine Wonder Stone, Porcupine Quills, Minerals, Rare Foreign Stamps, Tin Tags, Sharks Teeth, Birds Wings, Odd Coins, etc., many of which are very old and rare, no 2 alike, for only 25c. Send at once before all gone. Satisfaction guaranteed.

CURIOSITY CO., Box 308, Kennedy, N. Y.

SPECIAL OFFER.

UNUSED SETS

| | |
|---------------------------------|---------|
| Badenland post. 3 var. | 6 cts. |
| Bergedorf, 5 var. | 9 cts. |
| Constantinople, 3 var. | 6 cts. |
| Guatemala, 1875 4 var. | 22 cts. |
| Helegoland, 1877, 8 var. | 20 cts. |
| Roman States, 7 var. | 12 cts. |
| Sardinia, 9 var. | 8 cts. |
| Siam, 5 var. | 75 cts. |
| 250 extra mixed Foreign Stamps. | 6 cts. |
| 50 " var " " | 8 cts. |

Send for one of my Approval Sheets, which are the *Best and Cheapest* in the market, 25 to 33 1/4 percent. Commission or Net. References required.

A PRESENT.

To every one that answers this and orders something I will make a present of Two Rare Unused Stamps free. Send for price list. All kinds of U. S. stamps wanted. Address.

F. N. MASSOTH, Jr., Stamp Dealer,
Hanover Center, Indiana.

CINNABAR wanted in quantity. Address, quoting prices and quantity you can furnish. A. CHAMBERLAIN, Jersey City, N. J.

MARCH, 1887.

Price, 3 cents.

THE

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| ZINC AND LEAD MINES OF JASPER CO., MO., | 33 |
| MINERALS FROM VESUVIUS, | 34 |
| PSEUDOMORPHS, | 34 |
| METEORITE IN LIGNITE, | 34 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, | 35 |
| EDITORIALS, | 36 |
| HINTS, | 36 |
| EXCHANGES, | 37 |
| DISCOIDAL STONES, | 38 |
| DISCOVERY OF AN ANCIENT VAULT, | 38 |
| REPORT ON THE MINERALOGY OF GWYNEDD, PA., | 39 |
| MINERALOGICAL CLUB OF THE N. Y. ACADEMY OF SCIENCE, | 40 |
| VOLCANIC FRAGMENTS FROM THE LAKE OF BRACCIANO, | 40 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning **THE EXCHANGERS' MONTHLY**. Advertisements must be in by the 20th of the month to insure insertion in next number.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of **STAR RIDERS** and **Cyclists in General**.

E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE, East Rochester, N. H.**

Make Money Orders and Drafts payable to **E. H. CORSON**.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.



THE Corona NEWS-LETTER

contains Mathematical Problems and Puzzles, Specimens of Modern Job Printing, Sketches of Life in a New York Printing Office, etc. Try the "Cat Problem," the "Steamer Problem," Judge Duffy's Quadratics, etc. Issued every 2 weeks, 50 cents a year—Sample, 2 cts. Address **NEWS-LETTER, Corona, Bergen Co., N. J.**

BEAUTIFUL MINERALS CHEAP.

Send for one of my descriptive price lists of the rare and handsome minerals of the famous mines of Jasper Co., Mo. Prices are the lowest. **GEO. D. STORY, Carterville, Mo.**

STAMPS! STAMPS!!

100 mixed foreign 3 c.
50 var. 4 c.

Sheets sent on approval to parties furnishing good reference, 25 to 50 per cent. cash commission. My stamps are marked lower than any other dealers. Address,

F. N. MASSOTH, JR.,
Hanover Center, Indiana.

10,000 WANTED 10,000

Subscribers.

Subscribers.

Every Poultry, Bee, Pet Stock Breeder, and everybody else who sends 15 cents for the **POULTRY RECORD** one year, we will insert an advertisement of 30 words **FREE**. Send at once. Address,

WILLIAM A. JONES,
Xenia, Ohio.

60 No 2 alike chromo cards, no trash, with name on, only 10 cts., 12 hidden name, 10 cts. 25 assorted chromo, 10 cts. Agents wanted **STAR CARD CO.** Box 209, College Springs, Iowa

FOR SALE CHEAP.

Fine Indian Pipes, Stone and Flint Tools, Minerals, Fossil Ferns, Mounted Birds, Books, and Fine Fossil Fish. List for Stamp
O. D. WALLBRIDGE, Marseilles, Ill.

35 RARE CURIOSITIES, such as Perfumed Palestine Wonders one, Porcupine Quills, Minerals, Rare Foreign Stamps, Tin Tags, Sharks Teeth, Birds Wings, Odd Coins etc., many of which are very old and rare, no 2 alike, for only 25c. Send at once before all gone. Satisfaction guaranteed.

CURIOSITY CO., Box 308, Kennedy, N. Y.

WE GUARANTEE YOU TO RECEIVE 500 Samples Books, Circulars, Letters and Papers **FREE** from firms all over the U. S. and Canadas if you send 20 cents to have your name in new issue of **AGENTS' NAME DIRECTORY**. Copy sent you with name inserted.

VERNON HILL, Va., Dec. 27, '86

ALLEN & CO., GENTS:—I have already received more than the 500 parcels of mail, many Newspapers, etc., of which I had often paid 10 c. each before. I advise all to have their name inserted at once. I know from experience your directory far exceeds all others.
R. T. JAMES, Agent.

ALLEN & CO., Box 308, Kennedy, N. Y.

A SAMPLE SELF-INKING STAMP which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc., all mailed free for 50 cts. (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

STAMP COLLECTORS!

Send 3 c. stamp, and a promise to return in 30 days, and receive an A1 approval sheet of genuine stamps. Address, **SCHIAFINO & CO., P. O. Box 74, Guadalajara, Mexico.**

ADVERTISING RATES, 1 to 12 insertions.

| | 1 | 2 | 3 | 4 | 8 | 12 |
|---------------------|--------|--------|--------|--------|--------|--------|
| $\frac{1}{2}$ inch, | \$0.25 | \$0.40 | \$0.50 | \$0.60 | \$1.00 | \$1.40 |
| 1 inch, | .50 | .80 | 1.00 | 1.20 | 2.00 | 2.80 |
| $\frac{1}{4}$ page, | 1.50 | 2.25 | 2.85 | 3.25 | 4.75 | 6.00 |
| $\frac{1}{2}$ page, | 2.75 | 4.25 | 5.25 | 6.25 | 9.50 | 12.50 |
| Page, | 5.00 | 8.00 | 10.50 | 12.50 | 18.00 | 23.00 |

THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., MARCH, 1887.

NO. 5.

ZINC AND LEAD MINES OF JASPER COUNTY, MO.

By GEORGE D. STORY.

PART I.

DESCRIPTION OF THE MINES AND PROCESS OF SEPARATING THE ORE.

JASPER Co. is situated in the southwest corner of the State, bordering on Kansas on the west and the Indian Territory on the southwest. It is situated on top of the Ozark mountains, yet you could not tell the difference by the surface configuration. The principal mines are situated in a valley between this place and Webb City, which is one-half mile away.

There are vast mines on three sides of this town and the continual blasting sounds like earthquakes. There are other mines at Joplin, Pronogo, Zincite, and several other places. Thousands of tons of zinc and lead have been shipped from here, and they have, comparatively speaking, only just begun; three railroads are constantly employed in hauling it away.

At Joplin, only eight miles away, there is situated the largest white lead works in the Southwest, which has recently been purchased by Eastern capitalists.

The mines have been worked for fifteen years, though at first only for the lead, as there was no market for zinc in the United States; but for the last ten years zinc has been the important factor, on account of its abundance. As a general rule the lead

is found above the zinc, sometimes within a few inches of the surface (the way it was first discovered here was by a farmer's plowing it up).

The zinc is found at a depth of from 25 to 200 feet, this being the limit at present on account of the drainage. The ore is found by sinking a shaft and driving a tunnel; then it is broken up by blasting, taken to the shaft by a car, hoisted to the surface and dumped into a large screen, which separates the coarse rocks and ore from the fine, which is washed at once by means of a jig; the coarse ore is taken to crushers and ground fine, when it is washed in the same way.

I suppose my readers would like to know what a jig is?

It consists of a tank five by six feet square, and three feet deep; on upright standards at either side is supported a long pole by means of an axle; at one end of this pole is suspended a box four feet long by two feet wide and one foot deep, the bottom being composed of a fine screen; on top of this is laid two or three inches of pure zinc about the size of marbles (this is called a bed); the tank is then filled with water and the jig is ready for work.

The ore is now dumped in until the box is full and a man lowers it into the water and shakes it by means of a long pole; this causes the lead to settle to the bottom of the tank, followed immediately by the zinc. The flint and waste rock, which remains on top of the bed, is then scraped off and thrown away. The ore remaining at the

bottom of the tank is ready for market, if there is not any lead in it, where it brings on an average \$20.00 per ton. If there is lead in the ore, it is separated from the zinc in the same manner as before, except that a bed consisting of lead is used; this causes the zinc to remain on top, it being the lightest, and the lead to sink to the bottom of the tank. Some of the jigs is run by steam.

[TO BE CONTINUED.]

MINERALS FROM VESUVIUS.

By PROF. E. SCAACCHI.

THE author has recently described the following:

1. Hydrogioberite is the name given to a new hydrated magnesium carbonate, which occurs in the form of grey compact masses, 2 to 15 mm. in diameter. With the lens, minute magnetite crystals are observed enclosed in the mass. The sp. gr. is 2.149 to 2.174. The loss on ignition amounted to 53.07 per cent. Of the sample 0.507 grams contained 0.0025 grams of magnetite and 0.022 grams of ferric oxide, which was subtracted as limonite with magnetite. An analysis yielded: Co_2 25.16 + MgO 44.91 + H_2O 29.93 = 100. The formula for the new mineral is $\text{Mg}_2\text{Co}_3 + 3\text{H}_2\text{O}$. The hydrogioberite was discovered near Pollena in a block of augitophyre very closely resembling lava. In the interior the structure was crystalline. On the rock was a compact mixture of silicates (plagioclase, augite and magnetite) with which the hydrogioberite was associated.

2. Altered Aragonite.—In the mother-rock of the hydrogioberite, described above, hexagonal prisms, 3-4 mm. long and 1-15 mm. broad, were found. They were white and opaque, and for the most part soluble in acid.

3. Fluorspar.—A number of minute octahedral crystals, occurring on a lava from Pollena (1872), were found to be fluorspar. The mineral has hitherto been unknown in the lavas of Vesuvius and other volcanoes. Associated with the fluorspar are minute acicular crystals of apatite.

Remarkable Crystal of Euclase.

THE crystal comes from the mining district of Boa Vista, near Villa Rica, Brazil, where alluvial strata containing diamonds occur with chloritic schist. The weight of the crystal is 15.45 grams, sp. gr. 3.087. It is 35 mm. long, sea-green like beryl, with vitreous luster, nacreous on the cleavage planes. One termination is perfectly developed, the other fractured. The prism ∞P gave the angle $144^\circ 37'$. The following planes were present: $\infty P \infty$, $\infty P \infty$, $0P$, ∞P ; $\infty P2$, $3P3$, $2P2$. The crystal is one of the finest crystals of euclase ever discovered.

Pseudomorphs.

E. DÖLL has recently described a new and several rare pseudomorphs from new localities. The pseudomorphs described are:

1. Marcasite after blende, from the talc-like nacrite of Schönfeld, near Schlaggenwald.
2. Iron pyrites after marcasite from Kapik.
3. Blende after galena and barytes in the quartz-andesite of Nagyag.
4. Quartz and red hematite after garnet from Carinthia.
5. Talc after quartz and dolomite from Oker in the Harz.

Meteorite in Lignite.

A METEORITE has recently been discovered in a block of tertiary lignite from Wolfsegg. It formed a rectangular parallelepiped 67 mm. by 62 mm. by 47 mm., and weighed 785 gams.

The meteorite is a holosiderite and contains carbon, with a trace of nickel, but no quantitative analysis was made. It showed cubical cleavage, but a polished surface did not show Widonastatt's figures when treated with acid.

FROM one ton of ordinary gas-coal may be produced 1500 pounds of coke, 20 gallons of ammonia water and 140 pounds of coal-tar.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART IV.

EARLY HISTORY OF THE MINE—LAYING IN A STOCK—PAUL GETTING SQUARE.

THE deposit of ore at this mine has been known for over 120 years, but when first discovered was supposed to be the red oxide of copper and was shipped to England as such to be reduced for the copper. The openings from which this was taken still remains, but large trees have grown around them, proving how long ago it was since the ore was taken out. Nothing definite is known from then until 1840, when the ore was again mined and Franklin Furnace built. Great difficulty was now found in reducing the ore, as when they attempted to extract the iron, the zinc passed off in the form of white oxide and carried so much heat with it as to chill the furnace and cause the but partially deoxidized iron to remain in an almost immovable mass at the bottom of the furnace. From this time on experiments have been made in the reduction of the ore until now no difficulty is experienced in reducing it. In the meantime the mines have not been without their troubles, but have been a source of litigation for over thirty years; but their troubles now are also over and they are at present worked by the New Jersey Zinc and Iron Company with a capital of over \$3,000,000.

At the conclusion of Mr. Pierce's narrative of the early history of the mine we inquired of him of the best place to secure specimens. He said we would find more at the dump than we would in the mine, but that we might possibly find something at the old openings. He also said that we would find more interesting specimens at Sterling Hill than we would find here.

After thanking him for his courtesy and promising to call and see him again before we left Franklin, we repaired to the dump and set to work, and until the whistle blew at 12 o'clock, nothing was heard but the

clink of a dozen hammers and chisels, with an occasional "Ah!" as one of us found an extra good specimen. To save time we had brought our lunch with us, so we now repaired to the spring spoken of, which was under an overhanging brow of the hill, and partook of our slight repast with a relish.

There was one thing that had made me feel uneasy all the morning, but which did not seem to be noticed by the rest of the boys, and that was that Paul M. and Henry W. L. had been keeping close company and I made up my mind they were concocting some scheme to repay us for the bull joke we had played on them.

I had also noticed them in the morning having an earnest conversation with the young lady of the house, at which she was laughing very heartily as though in anticipation of some fun. So I concluded to keep my weather-eye open. After lunch we repaired again to the dump and from then until six o'clock we worked away almost without intermission. We had laid our specimens beside us as we secured them, so we now set to work to sort and pack them in our satchels, as we each had about three times as many specimens as we could carry.

The specimens we secured consisted mostly of Franklinite, Jeffersonite, Willemitite and Grossularite.

We were not sorry by the time we got to the foot of the hill to see the farmer coming down the road in his wagon, as we each had from 30 to 50 lbs. So we put our satchels in the wagon and started for our present home with tired limbs and empty stomachs.

In order to try and find out what scheme they had on hand, I walked as close behind Paul and Henry and as near to them as I could get without raising their suspicions. I could find out nothing, however, as they took care not to say anything loud enough to have it reach my ears.

As we entered the house I saw the farmer's daughter wink at Paul and then Paul nudged Henry. I then made up my mind that the hour of retaliation was at hand.

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year.....\$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch......50

Per Column.....2.75

Per Page.....5.00

Liberal discount on standing ads.

Nothing less than a half-inch ad. taken.

Advertisements must be in by the 20th, and exchanges by the 15th of the month to insure insertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

The following anonymous communication was sent us with a request to print. We appreciate his modesty in not annexing his name to the communication, as a great many subscribers write testimonials for the simple reason of getting their names in print. As our subscribers know, we have never used any of our limited space with such un-interest matter as testimonials, publications received, etc. We will, however, make an exception this time but will promise not to do it again.

E—, —, Feb. 15th, '87.

To the Editor of EXCHANGERS' MONTHLY.

DEAR SIR:—In Feb. No. you remark with pride the fact that many interesting and useful articles are contributed by the subscribers. May I give a few reasons why I think they identify themselves so closely?

1. It is to their own interest.
2. Its cheapness.
3. Its regularity in always issuing at the first of the month.
4. What you do for your patrons is fully appreciated.
5. Care in conforming strictly to style of copy as to arrangement, spelling and punctuation.
6. All the latest news concerning mineralogy.

Amateur editors would do well to consider these reasons. I would also add for their benefit this: When sending copies of their papers to new addresses, send only the later issues. The paper is judged by specimen sent. Each editor, I am sure, would like his efforts to be favorably received.

→ HINTS ←

MOUNT your small and rare specimens on rhombs of calcite or dolomite in such a manner that the rhomb will have a corner to the front. The result is a great improvement over the wooden blocks. —T. J. LEWIS.

IF you are the happy possessor of a cabinet, don't put it in a dark room, lock the door, and keep your friends out. Put it where light and sunshine make it most attractive, and where every one may see the many curious and beautiful objects of nature. —C. E. MASON.

WITH the following composition glass can be etched with an ordinary steel pen: Take equal parts of the double hydrogen ammonium fluoride and dried precipitated barium sulphate. Grind well in a porcelain mortar. Then treat this mixture in a lead or gutta-percha dish with fuming hydrofluoric acid until the acid ceases to react. This is very effective and makes a good ink to etch labels on reagent jars, especially if they contain caustic alkalies. —T. S. ASH.

IN preparing sections of rocks for microscopical study, which are exceedingly porous or full of cavities, such as pumice-stone, or of a drossy character, or friable and fragile, as tufa, first boil them in Canada balsam, to make possible the grinding of a plane surface, as the balsam forcing its way into the cavities, and becoming solid on cooling, imparts to the whole a greater degree of consistency. Sections easily shattered may be prepared more safely by Canada balsam dissolved in ether or chloroform. —T. S. ASH.

✧ Exchanges ✧

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

I have minerals, 2x3, shells and curiosities to exchange for same. Send lists. W. W. DOUGLAS, Romeo, Mich.

Fine sea shells, fossil ferns, books and mounted birds in exchange for stone and flint Indian relics. O. D. WALBRIDGE, Marshfield, Ill.

A rare mineral for every 100 neatly written or printed names and addresses sent me. Any quantity taken. C. HADDAWAY, Easton, Md.

Minerals and scientific books for minerals and books on assaying. Pseudomorphs and quartz crystals wanted. J. E. UNDERHILL, 144 S. Elliott Pl., Brooklyn, N. Y.

Foreign and native shells, transparent copal and minerals in exchange for minerals. Good specimens given and desired. Miss MARY L. SAWYER, Roxford, Mass.

I wish to exchange some selenite crystals and handmade goosequill pens for any relic or curiosity sent me and will send one or both. B. F. PHILLIPS, North Jackson, O.

An Imperial stamp a bun with over 175 rare stamps for an Indian axe-head, eight arrowheads, an arrow, pestle or three spearheads. OSCAR HEISS, 956 Shackamaxon St., Phila., Pa.

Wanted, a dime of 1826 and one of 1827, also a one-cent piece of 1817. I will give in exchange birds' eggs, stamp papers, sea curiosities, minerals, tin tags, cards, etc. W. P. ARNOLD, Shan-nock, R. 1.

Autographs of Neal Dow, Jeff. Davis, Belva A. Lockwood, Eli Perkins, Th. Nast and others to exchange for any writings, signatures, etc., of noted persons. Send list. ELIAS D. ROBB, Eldora, Iowa.

I will exchange Ohio Geol. Survey, books, Italian bees and queens, or fossils for a good turning lathe with emery wheel attached or emery wheel on mandril alone. D. A. McCORD, Oxford, Butler Co., O.

Vol. 1 Young Oologist, Vol. 3 Oologist, Manton's Taxidermy, Oologists' Hand-Book, and three Red-headed Woodpeckers' eggs, worth \$2.50, for type, etc., or offers. WEBSTER C. SPAYDE, Steelton, Dauphin Co., Pa.

Wanted, fine crystalline minerals, petrifications, colonial, continental, confederate and fractional currency; also confederate bonds and State issues; will give liberal exchange in fine minerals from this locality for the above. Books to exchange for books on Natural History. G. D. STORY, Cartersville, Mo.

Radiated talc, chondrodite crystals, magnetite crystals, brucite, spodumene, siderite, beryl, rose quartz, garnet crystals, albite, and many other fine minerals to exchange for minerals not in my collection. Send lists. C. A. QUINTARD, Norwalk, Ct.

"Coin and Coinage," new illustrated history of the U. S. Mint, over 100 pages, over 100 illustrations of rare coins. Will exchange the above for 40 cts. worth of perfect Indian relics, minerals or marine specimens. J. R. NISSLEY, Ada, Hardin Co., O.

Tobacco tags for same, 500 postmarks for 125 tin tobacco tags, an illustrated magazine, the Judge, for every 25 different tobacco tags, 3 postmarks for every tin tobacco tag and 7 for every one not in my collection. ASHLEY CRAPO, 513 N. 6th St., Burlington, Iowa.

Fine cabinet photographs of Louis Riel, Whittier's birthplace and the Greeley survivors, taken just after their return from St. Johns, also stereoscopic views of the interior of the old kitchen at Whittier's, looking into the room where the poet was born, for minerals and geological specimens. Box 78, Groveland, Mass.

Fine specimens of goodes, honeycomb coral (fossil), crystallized quartz, limestone, and pink granite to exchange for corals, sea shells, star fish, sea urchins, horseshoe crabs, whales', sharks', and alligators' teeth, Indian relics of all kinds. Geological books and instruments particularly desired. L. H. HENRY, Bonaparte, Iowa.

A Craig microscope, cost \$3, for the best offer of a Dana's Mineralogy, latest edition, minerals, fossils, Indian relics, or books relating to mineralogy, or an electric battery in good order. Also have a blowpipe, brass, and a tin spirit lamp and minerals for other minerals and named fossils. ARON HAMBURGER, Box 1, North Wales, Penn.

A Ruby magic lantern with eighteen slides for a stamp album, stamps or tin-tags. Forty fine stamps for every special delivery stamp, no less than five taken. Two hundred mixed for a triangular Cape of Good Hope stamp. Stamps for stamps. Please send lists of what you want and what you have. V-nickels without the word cents wanted. Send offers. J. R. FLANAGAN, 11 Malden St., Boston, Mass.

Kendall's Treatise on the Horse and Robinson Crusoe, all valued at 75 cts., to exchange for either a photograph album, book entitled High and Low Life in New York, or a gold watch-chain. All the above must be new and worth at least 35 cts. Any one having a self-inking printing press, chase 8x10 in., in good order, that they will exchange for books, cards, etc., will please write to me. All inquiries answered. Exchange list free. FRED. S. GOLDSBURY, Box 4, Barre, Vt.

❖ Archæology ❖

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

DISCOIDAL STONES.

By R. W. MERCER.

THE double-convex discoidal stones are no doubt the most interesting objects known in North American Archæology. Small specimens from two to four inches in diameter, are found sparingly in the valleys bordering on the Ohio River in Ohio, W. Va., and Kentucky. As usual in all localities they are made of granites, quartzites, and other exceedingly hard material. The natives of the above named localities insist that they were used to contain hematite, an ocre war-paint, which is about as correct a conclusion as can be arrived at. In the southern part of Kentucky and Tennessee, they are found more abundantly and of larger proportions, as well as in Illinois and Missouri. But the headquarters for fine quartzite discoidal stones of the largest dimensions, is in the neighborhood of Mazeppa, Ga., where they are found quite abundantly, and the finest specimens can now be purchased at from \$3 to \$5 each.

In this locality there occasionally occur small pottery discoidal stones, about one and one-half inches in diameter, that are no doubt of more recent Indian origin. One from this locality was pronounced by an Eastern expert as doubtless a fraud, but now the same Flint-jack catalogues them as genuine, stating the authenticity of each is perfectly established. Would advise collectors to beware of all dealers who have described and sold by auction a hand-painted axe as made of a rare mineral, and keeps on hand for exhibition collections of so-called fraudulent relics, for the sole purpose of causing deception and distrust, and filling their pockets at the expense and detriment of others.

Indians of New England, by J. J. Alton, will appear in next number.

DISCOVERY OF AN ANCIENT VAULT.

By JOSEPH WIGGLESWORTH

A RANCHER near Albuquerque, New Mexico, recently commenced digging for a well on the site of an old ruined pueblo. At eight feet he struck a huge boulder. Underneath this was found masonry, and when this was pierced a cavity was discovered. Upon examination it was found that the workmen had penetrated through an arch of stone, supported by heavy pillars of masonry and large pine timber. When the debris was cleared away, a volume of pure water was disclosed, sufficient to supply a great number of cattle. Among the discoveries made in the vault were stone axes and hammers, flint knives, arrowheads, and quantities of pottery in fragments. Human remains was also brought to the surface, including two skulls in an excellent state of preservation. The building is supposed to have belonged to an extinct race of people, as the relics found evidently antedate anything hitherto discovered in this territory.

GRAVEL HILL must have been the site of a great pottery, belonging to the ancient inhabitants of Delaware. This hill overlooks the Christiana Creek, some two miles from the city of Wilmington; and here, after a heavy spring rain, it is no trouble for the collector to find a hundred fragments of pottery with a few hours search.

A LARGE number of rough arrowheads have been found near Wiers, N. H. One local archæologist is reported to have found a quarter of a peck of broken ones in a day.

THE earth's internal heat is now being forced into practical service at Pesth, where the deepest artesian well in the world is being sunk to supply hot water for public baths and other purposes. A depth of 3,120 feet has been reached, and the well supplies daily 176,000 gallons of water heated to 158 degrees Fahrenheit.

REPORT ON THE MINERALOGY OF GWYNEDD, PA.

By ARON HAMBURGER.

SECOND PAPER.

In our first paper we gave but a meager outline of the mineral species of Gwynedd, Pa. In this it shall be our intention to more fully describe these species.

The molybdenite mentioned in our first paper, was first found by us in dolomite with muscovite, and later, more largely, by two young collectors, in blue calcite with biotite, muscovite and a mineral thought by those to whom I have sent it, to be jefferite.

Molybdenite (MoS_2) is the native bisulphide of molybdenum; is of a grayish graphite-like color, and highly infusible. Its solvent is nitric acid.

The garnetiferous mica-schist, or garnet schist, found at this locality, is of a silvery color and richly variegated with isometric crystals of garnet $\frac{1}{2}$ [$(3\text{FeO}_3 + \frac{1}{2}\text{AlO}_3)_2 \text{SiO}_2$].

Beautiful coal specimens on feldspar of various colors were found, by us upon a basaltic trap-rock.

The various colored feldspars found here occur in great abundance, but it will be hardly necessary to describe this well-known mineral species.

In a stone quarry near the borough of North Wales are found very interesting specimens of sulphur diffused through trap-rock.

In many parts of this township are seen many rocks which indicate a once probable volcanic upheaval.

On a farm above Gwynedd occur crystals of calcite, which, as stated in our first paper, are crystallized in a peculiar, round, pill-like, transparent form. The limestone forming the gangue being surrounded by masses of these crystals, adds greatly to the interest of the specimens. They are almost as transparent as rock crystals.

Traces of lead (Galena, PbS) were discovered by us in North Wales.

We also found in the same borough, a ledge of pyrite, both of iron and of arsenic.

The pyrites of iron (FeS_2) had a beautiful gold-like appearance and was very showy. The arsenical pyrites ($\text{FeS}_2 + \text{FeAs}$) were of a silvery-white color. When heated, they gave off arsenic fumes.

Of calcite, we omitted to say that crystals of it (CaCO_2) doubly terminated were brought to us from Gwynedd. The twinned crystal of calcite noticed in our first paper was of a green color, very small and was pried from between layers of shale near the Gwynedd tunnel, on the North Pennsylvania Railroad, whose road-bed was at this point cut out of solid rock.

In this township are numerous quarries of diorite, sandstone, and red shale. The last named seems to be the most abundant rock of the Gwynedd formation. It is a very free working stone and may be easily split into thin slabs. It is much used for building purposes in this township, as it is both abundant and cheap. We think it rather false economy to use this stone, as it is all but durable, and being very porous, absorbs much moisture.

Graphite mixed with clay is found near North Wales, but the graphite is of poor quality and it is difficult to separate it from the clay.

Dendrite or forest rock is found near the Gwynedd tunnel between layers of shale, slate, and feldspar. The beautiful tree-like appearance is thought to be due to the presence of manganese.

The species above named, and in some instances described, comprise the more important of the Gwynedd minerals.



ACCIDENTAL FORMATION OF CERUSSITE CRYSTALS UPON ROMAN COINS.—Cerussite was found upon Roman copper coins from Algiers, containing 16.20 per cent. of lead and 3.97 per cent. of tin. The coins were cemented together by copper carbonates, and the geodes formed between and around them contained cerussite, small cubes of cuprite with malachite and azurite. It is probable that the cerussite was formed by the action of solutions which had taken, up alkali, Co_3c , from the masonry.

MINERALOGICAL CLUB

OF THE

NEW YORK ACADEMY OF SCIENCE.

THE fifth meeting of this Club was held at the residence of the Rev. A. P. Atterbury, 117 W. 87th St., on Tuesday evening, Feb. 1st, 1887. The features of this meeting was the number of fine specimens brought by the members for exhibition. Mr. Kunz exhibited two large photos. of a new meteorite from Johnson Co., Arkansas, in his possession, which weighs 99 lbs., and is said to be the tenth meteorite which has been seen to fall and has been afterwards secured. He exhibited a small piece of it and gave a description of its fall. He also exhibited some pieces of the famous Santa Catherina (Brazil) Meteorites. These were almost entirely altered to limonite. Mr. Hidden exhibited a number of interesting specimens among which were some Emeralds from Alexander Co., N. C., one being a double-terminated crystal 2 in. in length and 1 in. in diameter, and another smaller one in matrix which had four more faces than had before been observed in United States Emeralds. He also gave an interesting description of the working of the deposits of these gems, which occur in pockets with rutile, monazite, quartz, and mica. Another specimen was a quartz crystal containing included crystals, supposed to be altered Hornblende. Mr. Niven exhibited some fine iridescent crystallized chalcopyrite, from French Creek, Pa., which led to a discussion as to whether the colors were not due to artificial means. This will probably lead to some interesting experiments. Mr. B. B. Chamberlain exhibited some of his unequalled New York City specimens. The only business transacted was a request to the committee on organization to report at next meeting.

All mineralogists wishing to join this club should send their applications for membership to either Mr. George F. Kunz, at Tiffany's, New York City; Mr. B. B. Chamberlain, 247 W. 125th St., New York City; or Prof. D. S. Martin, 236 W. 4th St., New York City.

All lovers of this science are invited to send in their applications for membership.

Volcanic Fragments from the Lake of Bracciano.

By G. STRUVER.

(Left. Kryst. Min., 12. 197-200.)

NUMEROUS volcanic fragments have recently been discovered in the district between l'Anguillara and the Lake of Martignano, in the midst of an enormous heap of angular fragments of limestone, leucite, and tephritic lavas, leucite phonolites, and trachytes. Similar materials have been found at Monte S. Angelo and near Cesano, in grey tuff. In these volcanic fragments, the following minerals have been found:

Pleonast, magnetite, limonite, wollastonite, pyroxene, hornblende, garnet, idocrase, humboldtite, merxene, sarkolite, nepheline, banyn, leucite, anorthite, sanidine, titanite, apatite, and calcite.

Of the minerals, sarkolite is the most interesting, as it has hitherto only been observed as a rare mineral in the Somma volcanic bombs.

The crystals are 10 mm. long, 10 mm. broad, and 5 mm. deep.

The combinations observed are $OP \cdot \infty P \cdot P$, and $OP \cdot \infty P \cdot P \cdot P \cdot \frac{1}{2} P \cdot \infty P \cdot 3P3$. Fracture conchoidal, vitreous luster, flesh color or colorless, translucent to transparent, streak white, hardness 6, optically uniaxial, double refraction positive.

GANOMALITE.—G. Lindström, has examined this specie from Jackobsberg; it was carefully purified by the magnet and by iodide solution. He writes the formula: $3PbO, 2SiO_2 + RO, SiO_2$.

PROF. IRBY, has observed 49 rhombohedrons, and 100 scalenohedrons; on the specie calcite.

CHLOROPHYLLITE from Loquidy, near Nantes, has been discovered by Dr. Baret.

MEXICAN MINERALOGICAL OFFICE

AND

→ LABORATORY FOR ANALYTICAL CHEMISTRY, ←

LANDERO & CO., ENGINEERS,

P. O. BOX 34, GUADALAJARA, MEXICO.

Large stock of Minerals for sale. Correspondence received in Spanish, English, French, Italian, Portuguese, and German, and promptly attended to.

TERMS: Cash with orders. Satisfaction guaranteed, or money refunded. Remittances can be made by bank draft or money order payable in New York. U. S. postage stamps of current issue and low denominations, unused, clean, and not stuck together, accepted same as cash.

Any specimens from the following price-list are sent by mail post-paid.

| | | | |
|-------------------------|---------------|-----------------------------------|---------------|
| Analcite..... | \$0.10 to .50 | Graphite..... | \$0.10 to .30 |
| Alumogen..... | .10 to .20 | Gypsum, xls..... | .50 to 1.00 |
| Amethyst..... | .05 to .50 | Satin spar..... | .05 to .25 |
| Amianthus..... | .05 to .20 | Selenite..... | .05 to .25 |
| Andalusite..... | .20 to 1.00 | Hematite..... | .05 to .50 |
| Anglesite..... | .20 to 1.50 | Hem andite..... | .30 to 1.50 |
| Antimony..... | .10 to 1.00 | Idocrase..... | .10 to .30 |
| Apatite..... | .15 to 2.00 | Lazulite..... | .50 to 2.00 |
| Apophyllite..... | 1.00 to 3.00 | Lepidolite..... | .15 to .30 |
| Argentite..... | .50 to 1.50 | Limonite..... | .05 to .50 |
| Asphaltum..... | .03 to .20 | Magnetic pyrites..... | .15 to .30 |
| Autunite..... | .15 to .50 | Magnetic sand (titaniferous)..... | .05 |
| Azurite..... | .10 to 4.00 | Magnetite..... | .05 to .30 |
| Barite..... | .05 to 1.00 | Malachite..... | .10 to 1.00 |
| Beryl..... | .10 to .50 | Margarite..... | .25 to .50 |
| Biotite..... | .15 to .50 | Menaccanite..... | .30 to .60 |
| Bismuth..... | .15 to .50 | Mesolite..... | .25 to 1.00 |
| Blende..... | .10 to 1.00 | Mispickel..... | .10 to .25 |
| Bornite..... | .05 to .50 | Molybdenite..... | .15 to 1.00 |
| Calcite, xls..... | .25 to 1.00 | Natron..... | .05 to .15 |
| Calc spar..... | .05 to .15 | Obsidian (fine shades)..... | .05 to .20 |
| Mex. onyx..... | .05 | Opal, precious..... | 1.00 to 5.00 |
| Do. pol. one side..... | .20 | Opal, milky..... | .10 to .50 |
| Do. pol. object..... | .50 to 3.00 | Opal, Hyalite..... | .30 to 1.00 |
| Cancrinite..... | .10 to .50 | Opal, semiopal (dif. shades)..... | .05 to .30 |
| Carnelian..... | .10 to .50 | Onyx-opal..... | .15 to 1.00 |
| Cassiterite..... | .10 to 1.00 | Onyx (quartz)..... | .10 to .50 |
| Celestite..... | .25 to 1.00 | Prehnite..... | .15 to 1.00 |
| Cerargyrite..... | 1.00 | Psilomelane..... | .05 to .20 |
| Cerussite..... | .25 to .50 | Pyrrargyrite..... | .50 to 3.00 |
| Chalcedony..... | .10 to .50 | Pyrite..... | .10 to 1.00 |
| Chalcocite..... | .10 to 1.50 | Pyrolusite..... | .10 to .50 |
| Chalcopyrite..... | .05 to .50 | Quartz, xls..... | .05 to 1.00 |
| Chrysocolla..... | .15 to .50 | Quartz, Jasper..... | .05 to .20 |
| Chrysolite..... | .05 to .60 | Quartz, Silicified Wood..... | .10 to .50 |
| Chrysolite..... | .30 to 1.50 | Rhodonite..... | .10 to 1.00 |
| Chunabir..... | .10 to 2.50 | Rubellite..... | .15 to .50 |
| Columbite (Niobit)..... | .10 to 2.00 | Silver..... | .25 to 1.50 |
| Copper..... | .25 to 1.00 | Sodalite..... | .15 to .50 |
| Corundum..... | .75 | Sphene..... | .15 to 1.00 |
| Crocidolite..... | 1.00 | Sulphur..... | .05 to .20 |
| Crocoite..... | 1.00 | Trydimite..... | .30 to 1.00 |
| Cryo te..... | .15 to .50 | Triplite..... | .15 to .50 |
| Caprite..... | .20 to 2.00 | Vivianite..... | .10 to .40 |
| Cyan te..... | .10 to .30 | Wad..... | .05 to .50 |
| Fluorite..... | .05 to 1.00 | Zircon..... | .05 to 1.00 |
| Galenite..... | .05 to .50 | | |
| Gold..... | .50 to 1.00 | | |

Address.

LANDERO & CO., ENGINEERS,

P. O. BOX 34, GUADALAJARA, MEXICO.

WM. NIVEN,
DEALER IN
FINE MINERAL SPECIMENS
AND
OBJECTS OF ART AND GENERAL USE
MADE FROM
JASPERIZED WOOD, LABRADORITE,
CROCIDOLITE, CARNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, Etc., Etc.

A SPECIALTY MADE OF
JAPANESE CRYSTAL BALLS
OF ALL SIZES.

739 BROADWAY, NEW YORK.

I FACOLUMITE, or Flexible Sandstone.
Specimens of this strange and interesting mineral from 15 to 50 cts. ARTHUR CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

PHOTOS FOR GENTS ONLY.
Sure to suit. 2 for 10c., 6 for 25c., 12 for 40c. Address, F. G. OSGOOD, Ann Arbor, Mich.

16 complete stories by popular authors for 5 c. 807 popular ballads, all the latest, for 5 c. 85 gems of the poets, 5 c. 200 Æsop's Fables, 5 c. 40 dialogues and recitations, 5 c. Parlor magic, showing how to perform hundreds of amusing tricks in magic, etc., 5 cts. A large collection of wit, humor, and fun, 5 c. All in neat pamphlet form for 25 c. C. HADDAWAY, Easton, Md.

OCCURRENCE AND FABRICATION OF Rock Crystal, with five illustrations, as contained in Nos. 1-4, Vol. II., of EXCHANGERS' MONTHLY, price 10 cts.

A Buffalo Horn, post-paid, 50 cts.

A pair of same, post-paid, \$1.00.

A Buffalo Tooth, post-paid, 10 cts.

Stamps accepted, but coin preferred.

Price list of minerals free.

A. C. KENNEDY,

Blatchford, Custer Co., Montana.

INDIAN CELTS.

I have lately received a few fine Indian Celts, found in the Miami Valley. Fine, perfect specimens.

50 cents each, post-paid.

JOSEPH WIGGLESWORTH,

DEALER IN FINE INDIAN RELICS,
Wilmington, - - - Delaware.

O PAIS from Honduras. Specimens of this beautiful mineral, showing different shades of red and green, from 25 cents to \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

LOOK! 10 Recipes. How to make Gold, Silver, Red, Yellow and Secret Writing Inks, and Rubber Hand Stamps, to Petrify Wood, to Preserve Birds and secret for Game and Fish, post-paid, 25 cents. J. E. HARTMAN, 1435 State St., Chicago, Ill.

SPHALERITE,
OR
RUBY BLENDE.

I have just received from

JOPLIN, MO.,

about 300 fine specimens of this beautiful mineral, which represent the

CREAM

of all the specimens taken from these celebrated mines, and will sell them at

25 Cents to \$2.00

a specimen. This is a rare chance to secure a fine specimen of this mineral cheap.

A. CHAMBERLAIN,

284 PAVONIA AVE., JERSEY CITY, N. J.

CHOICE AND HANDSOME SPHALERITE.
Iron Pyrites (cluster), Quartz Crystals (cluster) and Galenite. Fine crystalline specimens of these beautiful minerals, 25 cts. to \$3.00. Do not miss this chance to secure choice specimens from these celebrated mines. G. D. STORY, Carterville, Mo.

THE ARIZONA MINERAL COLLECTION.

PUT UP BY

MR. WILLIAM NIVEN,

Late Assistant-Commissioner, Arizona Territory,
World's Fair, New Orleans.

ONLY 50 CENTS A BOX.

This is the most attractive collection that has yet been put in the market, and should meet with a large sale. It consists of 12 specimens packed in cotton in a partitioned box, each accompanied by a printed list giving name of mineral, composition, etc., together with an engraving of the Natural Bridge, Chalcedony Park, Arizona Territory, which is made entirely of the wood of which this collection contains a piece.

A. CHAMBERLAIN,

284 Pavonia Ave., Jersey City, N. J.

VOL. II.

NO. 6.

APRIL, 1887.

Price, 3 cents.

THE

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| SUPERSTITIONS ABOUT OPALS, - - - - - | 41 |
| PSEUDOMORPHIC SENARMONTITE CRYSTALS, - - - - - | 42 |
| GALENA WITH OCTAHEDRAL CLEAVAGE, - - - - - | 42 |
| RUTILE AS A DECOMPOSITION OF TITANITE, - - - - - | 42 |
| LANGUAGE OF PRECIOUS STONES, - - - - - | 42 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - - - - | 43 |
| EDITORIALS, - - - - - | 44 |
| HINTS, - - - - - | 44 |
| EXCHANGES, - - - - - | 45 |
| PLANS OF NEW ENGLAND, - - - - - | 46 |
| MUMMIES FOUND IN DAKOTA, - - - - - | 46 |
| ZINC AND LEAD MINES OF JASPER CO., MO., - - - - - | 47 |
| MINERALOGICAL CLUB OF THE N. Y. ACADEMY OF SCIENCE, - - - - - | 48 |
| CRYSTALLINE SYSTEM OF CRYOLITE, - - - - - | 48 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of STAR RIDERS and Cyclists in General.

E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE, East Rochester, N. H.**

Make Money Orders and Drafts payable to E. H. CORSON.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.



IF 3 CATS CAN CATCH 3 RATS IN 3 MINUTES, HOW MANY CATS CAN CATCH 100 RATS IN 100 MINUTES. A humorous solution given in

THE Corona NEWS-LETTER

Issued every 2 weeks, 50 cents a year—Sample, 2 cts.

Address NEWS-LETTER, Corona, Bergen Co., N. J.

OPAALS from Honduras. Specimens of this beautiful mineral showing different shades of red and green, from 25 cents to \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

STAMPS! STAMPS!!

100 mixed foreign..... 3 c.
50 var. 4 c.

Sheets sent on approval to parties furnishing good reference, 25 to 50 per cent cash commission. My stamps are marked lower than any other dealers. Address,

F. N. MASSOTH, Jr.,

Hanover Center, Indiana.

OCCURRENCE AND FABRICATION OF Rock Crystal, with five illustrations, as contained in Nos. 1 4, Vol. II., of EXCHANGERS' MONTHLY, price 10 cts.

10,000 WANTED 10,000

Subscribers.

Subscribers.

Every Poultry, Bee, Pet Stock Breeder, and everybody else who sends 15 cents for the POULTRY RECORD one year, we will insert an advertisement of 30 words FREE. Send at once. Address,

WILLIAM A. JONES,
Xenia, Ohio.

60 No 2 alike chromo cards, no trash, with name on, only 10 cts 12 hidden name, 10 cts 25 assorted chromo, 10 cts. Agents wanted STAR CARD CO., Box 209, College Springs, Iowa.

FOR SALE CHEAP.

Fine Indian Pipes, Stone and Flint Tools, Minerals, Fossil Ferns, Mounted Birds, Books, and Fine Fossil Fish. List for Stamp
O. D. WALLBRIDGE, Marseilles, Ill.

35 RARE CURIOSITIES, such as Perfumed Palestine Wonder Stone, Porcupine Quills, Minerals, Rare Foreign Stamps, Tin Tags, Sharks Teeth, Birds wings, Odd Coins etc., many of which are very old and rare, no 2 alike, for only 25c. Send at once before all gone. Satisfaction guaranteed.

CURIOSITY CO., Box 308, Kennedy, N. Y.

WE GUARANTEE YOU TO RECEIVE 500 Samples Books, Circulars, Letters and Papers FREE from firms all over the U. S. and Canadas if you send 20 cents to have your name in new issue of **AGENTS' NAME DIRECTORY**. Copy sent you with name inserted.

VERNON HILL, VA., Dec. 27, '86.
ALLEN & Co., GENTS:—I have already received more than the 50 parcels of mail, many Newspapers, etc., of which I had often paid 10c each before. I advise all to have their name inserted at once. I know from experience your directory far excels all others.
R. T. JAMES, Agent.

ALLEN & CO., Box 398, Kennedy, N. Y.

A SAMPLE SELF-INKING STAMP which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc., all mailed free for 50 cts. (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

STAMP COLLECTORS!

Send 3c. stamp, and a promise to return in 10 days, and receive an A1 approval sheet of genuine stamps. Address, SCHIAFINO & CO., P. O. Box 74 Guadalajara, Mexico.

ADVERTISING RATES, 1 to 12 insertions.

| | 1 | 2 | 3 | 4 | 8 | 12 |
|-----------|--------|--------|--------|--------|--------|--------|
| 1/2 inch, | \$0.25 | \$0.40 | \$0.50 | \$0.60 | \$1.00 | \$1.40 |
| 1 inch, | .50 | .80 | 1.00 | 1.20 | 2.00 | 2.80 |
| 1/2 page, | 1.50 | 2.25 | 2.85 | 3.25 | 4.75 | 6.00 |
| 1/2 page, | 2.75 | 4.25 | 5.25 | 6.25 | 9.50 | 12.50 |
| Page, | 5.00 | 8.00 | 10.50 | 12.50 | 18.00 | 23.00 |

REASONS WHY THE EXCHANGERS' MONTHLY IS A GOOD ADVERTISING MEDIUM.

The EXCHANGERS' MONTHLY has now (April, 1887) been published for a year and a half, so that it is no untried experiment but an assured success. Its record during this time has been such as to build up for it a firm foundation. Never behind time in publication. No skipping a month and making so-called double numbers. Always improving without additional cost to its subscribers. Its low subscription rate (25 cts. a year). Its neat, clean appearance and freedom from typographical errors. Its illustrated articles. Its able editing. The freedom of its columns from trashy matter, book notices, recommendations, and other matter which is of interest to no one. These are some of the reasons which has made one and all of its subscribers friends and has gained for it a name which is unequalled by any other amateur publication. Its subscription list has grown to an immense size, considering the short time it has been published, and there is every reason to believe it will continue to grow at the same rapid rate. Another reason for its success is its exchange columns, which are free to all. As Harpers' "Young People" continued to cut down the space allowed for exchange notices, exchangers have been forced to seek other publications in which to insert their notices, and we have received a fair share of these as subscribers to our MONTHLY. Now these very exchangers make the best of buyers, as it is a well-known fact that to secure anything really good, you must buy it, and that exchanging is only good to lay a foundation for our cabinets. Now the question naturally arises: As the EXCHANGERS' MONTHLY is devoted principally to Mineralogy, is there any good in my advertising Postage Stamps, Bird Eggs, Curiosities, etc., in its columns? The best answer to this is the fact that there has never been a number published without an ad. of Postage Stamps for sale in its columns. The reason of this is that the MONTHLY is not sent to subscribers only, but hundreds are sent to collectors of all kinds and to different ones every month. But after all the best way to convince yourself that our MONTHLY is a good advertising medium is to write to some of our advertisers and ask them if their advertisement pays them. We give below a table of rates which we think will compare favorably with that of any other monthly of our standing.

ADVERTISING RATES, 1 to 12 insertions.

| | 1 | 2 | 3 | 4 | 8 | 12 |
|---------------------|--------|--------|--------|--------|--------|--------|
| $\frac{1}{2}$ inch, | \$0.25 | \$0.40 | \$0.50 | \$0.60 | \$1.00 | \$1.40 |
| Inch, | .50 | .80 | 1.00 | 1.20 | 2.00 | 2.80 |
| $\frac{1}{4}$ page, | 1.50 | 2.25 | 2.85 | 3.25 | 4.75 | 6.00 |
| $\frac{1}{2}$ page, | 2.75 | 4.25 | 5.25 | 6.25 | 9.50 | 12.50 |
| Page, | 5.00 | 8.00 | 10.50 | 12.50 | 18.00 | 23.00 |

THOS. CHAMBERLAIN, JR.,

✻ PUBLISHER ✻

284 PAVONIA AVE., - - - JERSEY CITY, N. J.

THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., APRIL, 1887.

NO. 6.

SUPERSTITIONS ABOUT OPALS.

PART I.

A DEW-DROP came, with a spark of flame
He had caught from the sun's last ray,
To a violet's breast, where he lay at rest
Till the hours brought lack the day.

The rose looked down with a blush and
frown :

But she smiled, all at once, to view
Her own bright form, with its coloring warm,
Reflected back by the dew.

Then the stranger took a stolen look
At the sky so soft and blue ;
And a leaflet green, with a silvery sheen,
Was seen by the idler too.

A cold north wind, as he thus reclined,
Of a sudden raged around,
And a maiden fair, who was walking there,
Next morning an opal found.

The opal has always been the subject of much superstitious regard ; but while the present age accuses it of being the harbinger of ill-luck, the ancients venerated it as a stone of good omen, and invested it with power to banish evil spirits, to inspire pure thoughts, and to induce sweet dreams. If a supernatural agency is to be ascribed to gems, it is natural to conclude that the opal will be foremost on the list, on account of its peculiar susceptibility to outside influences. The flashing of colors in this stone

is due to the refraction of light on the tiny scales, and almost invisible fissures within the stone, which act like prisms, dividing the light and throwing out all the varying hues of the rainbow. But the play of color is liable to change. Dullness and brilliancy succeed each other with the regularity of atmospheric variations, moderate warmth having a distinct luminating effect, while much heat is capable of robbing the stone of all its beauty, by drying the moisture contained in the minute cells. Inanimate objects vested with such chameleon-like attributes are sure to be regarded with fear and wonderment by the imaginative ; and it is to be expected that a person looking for magic in the stone will see a danger-signal, if the gem loose its luster and fail to glow with its accustomed brilliancy. It is not strange that, before the workings of chemical analysis were within the reach of every one, opals should have seemed to possess occult powers, because there was no simple satisfactory explanation of their vacillating appearance. To-day there is no such excuse : science supplies us with a dictionary of the inexplicable, and a cyclopedia of the results of research. It is a curious fact that there are vapors emitted from the human body, in certain diseased conditions, that are capable of rendering the stone dull and opaque. Thus the fading of life or fortune and the fading of the opal may indeed be due to the same cause ; but every thoughtful person will observe that the added or diminished brilliancy is the natural sequence of given conditions upon

this impressible substance, and that the opal cannot possibly have any influence upon the wearer. Some superstitions, which are still current among educated and refined people, such as the bad luck of Friday, the spilling of salt, and thirteen at table, are simply matters of feeling, and seldom have any far-reaching effect; but the superstition in question really affects the enjoyment and circulation of one of the most beautiful objects of nature. One by one the vagaries of our ancestors are being done away with, and we believe in cause and effect, not in magic. It is full time that the lingering fancies concerning the opal should be banished forever, and sent flying after the witch and her broom-stick.

[TO BE CONTINUED.]

Pseudomorphous Senarmontite Crystals.

By C. HENTZE.

SEVERAL Senarmontite crystals from South Ham, in Canada, have a dark, rough surface. On closer investigation it was found that only the kernel of the crystals consisted of senarmontite, whilst the outer layer was antimonite, so that the crystal is a pseudomorph of antimonite after senarmontite. The kernel has, however, not been converted directly into antimonite, but first into an aggregate of valentinite fibers, which was afterwards converted into antimonite.

Galena with Octahedral Cleavage.

By A. BRAUN.

IN the Glacier de Lochaub (Chaine du Mt. Blanc), the author found a fine twin crystal of galena; the twin-face was O, and the crystal was formed by the faces of the octahedron and cube. The octahedral cleavage was very distinct. Sp. gr. 7.67. It contained some bismuth and a little iron. This is the third known example of galena with an octahedral cleavage; the other two are from the Habach valley and from Pennsylvania respectively.—JAHN. f. Min. 1-9-10.

Rutile as a Decomposition of Titanite.

By P. MANN.

IN some foyaites from the Serro de Monchique, the titanite was completely decomposed, and the author found in the decomposed mass numerous bright yellow crystals which, by the help of the microscope, he proved to be rutile. The lime had probably been extracted by the action of the water and converted into carbonate of lime, whilst the titanitic acid, mixed perhaps with some amorphous silica, formed the decomposed crust.—JAHN. f. Min. 2 200.

The Meteorite of Albarello.

By P. MAISSEN.

THE meteorite which fell at Albarello in July, 1766, has been analyzed by the author with the following results: Fe 4.332, Ni 0.730, Co 0.105, S 2.364, SiO₂ 35.913, FeO 24.313, Al₂O 4.479, MgO 22.773, CaO 2.073, H₂O 0.440, Na₂O 1.637, Loss 0.840, Mn and Cr traces. The silicate soluble in hydrochloric acid appeared to be analogous to olivine, and the insoluble to bronzite.

Language of Precious Stones.

THE quality of turquoise imparts a prosperity in love.

Chrysolite was used as an amulet against evil passions and despondency.

Conjugal felicity was symbolized by the sardonyx, which it was believed to insure.

The topaz was thought to promote fidelity and friendship and to calm internal passions.

The properties of the amethyst are to calm the passions of the body and prevent drunkenness.

The diamond has the mystic symbolism of light and purity, faith and uprightness of character.

Garnet or carbuncle represents constancy of purpose and fidelity to duty. It is pre-eminently the soldier's gem.

The agate or chalcedony represents physical prosperity, and it the stone of athlete and physician, and imparts longevity and health.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART VI.

PAUL GETS SQUARE.

As we entered the dining-room a sight which our hungry stomachs made us appreciate was the supper table with its load of steaming biscuits, maple syrup, honey, cold meats, fruits, etc. It did not take us long to set to work diminishing them, which we did with a vengeance. I never appreciated a meal more than this and the others said the same.

After supper we went outside to fully appreciate the beautiful evening air. But we had worked too hard on this first day of our collecting, and were soon half asleep. So we concluded we would go to bed early so as to be rested for the morrow.

It made me a little uneasy, however, when Paul and Henry said they would stay up a little while longer to enjoy the cool breeze.

Well, with the exception of these two, repaired to our rooms, which were four in number, and had a single and double bed in each.

I had made up my mind to keep awake for awhile, so as to see what Paul and Henry were up to. I told the boys my suspicions and asked them not to light a lamp but to undress in the dark so I could watch them. But we had not much more than got in our rooms when they both got up and came in the house, where I could hear them holding a low conversation.

By this time the boys had got undressed. They had not been in bed a minute, however, when they all commenced to sneeze as hard as they could, and they crawled out of bed in lively style sneezing all the way. At the same time I heard a slight noise outside the door, and as I was putting my ear to the keyhole I caught a lot of snuff right in the face, which one of them had blown through the keyhole, so I was soon sneezing as hard as the rest.

From every room you could hear the

sneezing going on, accompanied by exclamations which could not be found in any mineralogy, while from below we heard them laughing as hard as they could laugh.

We lit the lamp as best we could between our sneezes, but the hardest job was to get the chimney on. Every time we tried to put it on we would let out a sneeze and it would go about a foot away from the lamp. At last we got it fixed and started an investigation, when we found sprinkled over and around our pillows a fine white catarrh snuff, which the moment we touched set us sneezing. What to do we did not know. We made up our minds we would not vacate our rooms for the night, as that would give them more of a laugh on us. So we hit on the plan of tying our handkerchiefs under our noses and shaking the pillow-cases and sheets out of the window. What had been blown through the key-hole had settled to the floor and did not disturb us unless we walked around.

As I went to the window, which was of course open, to shake out the pillow-cases, I noticed that Paul, Henry and the young lady had gone out again and were sitting under the window having a quiet laugh to themselves. Telling the boys to get all the sheets and pillow-cases together, we went to the window and dropped the whole lot on their heads, nearly scaring the young lady to death and setting them all three to sneezing, at which we howled like wild men, while they beat a hasty retreat to the house.

I now slipped out and got the sheets, giving them a good shake before I brought them in, and we were soon at work making the beds again, stopping to laugh at each fresh sneeze from below. We now heard them coming up to bed as still as they could but we soon let them know we heard them and saluted them with mock sneezes. In spite of the excitement it was not long before we were all fast asleep.

When the bell rang in the morning we did not feel much like getting up and probably some would not have got up had the rest not have pulled them out of bed.

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year..... \$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch......50

Per Column.....2.75

Per Page.....5.00

Liberal discount on standing ads.

Nothing less than a half-inch ad. taken.

Advertisements must be in by the 20th, and exchanges by the 15th of the month to insure insertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

PROF. CROSBY, of the Mass. Institute of Technology, has just published a series of Tables, with descriptive text, for the "Determination of Common Minerals." All students in mineralogy know how hard it is to name a mineral by the description in a text-book. By the aid of Prof. Crosby's book this difficult feat is easily accomplished by anybody with a little common sense. As it seemed especially adapted to the majority of our readers, we considered it our duty to call their attention to it. It is neatly bound in cloth and published at a price within the reach of all, \$1.25, and can be had of Prof. W. O. Crosby, Soc. of Nat. Hist., Boston, Mass.

DR. E. RETHWISCH has identified in the species proustite and pyrargyrite 108 planes.

W. C. BRÜGGER has observed 14 planes on the specie Annerödite, from Anneröd, near Moss, Norway.

WE return thanks for three buffalo teeth sent us by A. C. Kennedy, Blatchford, Mon. Persons wishing specimens of these curiosities cannot do better than write him for prices.

A CRYSTAL of magnetite recently found at Oberstein, showed the plane $\frac{1}{2}P\infty$, which is new for the specie.

DR. G. FLINK has recently made a careful investigation of the geometrical and optical properties of crystallized rhodonite from Pajsberg and Langban, Sweden. He has observed 29 forms, of which number 19 are new.

ACCORDING to E Reyer, the solidification of lavas and metals display complicated phenomena which have given rise to various misinterpretations. Silicates generally solidify to a vitreous form in the dry heat of a furnace. If the congealed mass remains for a long time at a temperature close upon the melting point, approaches to crystallization take place, which are promoted by moisture.

PROF. MILNE, in a recent number of the Transactions of the Seismological Society of Japan, states that the lavas of the Japanese volcanoes (100 in all, of which 48 are still active) are chiefly andesites, the hornblende varieties of which frequently contain quartz. Those containing olivene approximate to basalts, though the true basalts are rare. A critical study of these rocks are now being made by members of the Japanese Survey.

◆ HINTS ◆

A READY way to determine the cleavage of a crystal is to place the edge of a knife upon a face parallel to some of the principal forms and strike a light blow with the hammer, when, if the direction is near that of a principal cleavage, a more or less flat-faced fragment will be removed.—T. S. ASH.

WHEN trying the fusibility of easily reducible metallic minerals, care must be taken that the point of the platinum forceps in contact with the assay are not strongly heated, as an alloy of the platinum with the more fusible metal may result. It is safer in such cases to try the fusibility upon charcoal.—T. S. ASH.

✧ Exchanges ✧

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

Amateur papers for same. Postmarks for shells, coins or minerals. GEO. A. STORER, 338 Clifton Place, Brooklyn, N. Y.

15 rare tin-tags or 10 rare stamps and 15 rare postmarks for every amateur paper sent me. A. K. BATES, Titusville, Pa.

For every stamp, coin or curiosity paper sent me, I will send a paper from this place. CHAS. T. Mc'LUNG, Wabash, Ind.

Rare minerals for same. Dealers send lists. Chuanabar, zinc ore, etc., wanted. D. HAMBURGER, Box 1, North Wales, Pa.

Birds' eggs to exchange for others. Please send list and receive mine. Philatelic papers for other papers. ULYSSES CLARK, Pipestone, Minn.

Pacific Coast literature, minerals, shells, etc., for Chinese and Japanese curios, books, etc. J. JOSEPH A. D'NOHUE, East Portland, Oregon.

Minerals and Indian relics for U. S. coins. I will give a cent of 1794, 1798, 1801 for a cent of 1796, in good condition. H. T. UPSON, Parkersburg, W. Va.

For each flowering bulb or strong slip sent me, I will promptly mail a nice package of silk for making all kinds of fancy work. LUCY H. COOMBS, Arcadia, Neb.

The first four parts of "Museum of Natural History," good as new, for its value (\$2.00) in first class bird-skins, with data. H. C. THAYER, 813 Pearl St., Los Angeles, Cal.

Rare U. S. and foreign postage and revenue stamps for fractional currency, match-wrappers or stamps not in my collection. W. P. YOUNG, Pond St., Jamaica Plain, Mass.

200 different tin-tags for the best offer of stamps, 10 tin-tags for every stamp not in my collection. Also postmarks and paper-heads for stamps. CLARENCE D. OLIPHANT, Mt. Holly, N. J.

A large lot of old U. S. stamps for minerals and curiosities. 400 old U. S. stamps, valued at \$5, for every bayonet, pistol, sword, or anything used in the battle of Gettysburg, Fredericksburg, or any other battle of prominence. RALPH MASON, Box 5, Mt. Holly, N. J.

Rare minerals, stamps and curiosities for large and fine minerals, 2x2. 10 numbers of "The Collectors' Companion" for offers in minerals. 20 numbers of "The Golden Argosy" for offers in minerals. 7 numbers of "The Monthly Journal" and 15 other stamp, coin and mineral papers for offers in minerals. D. W. C. BOSLER, Lock Box 87, Carlisle, Pa.

55 Nos. Harper's Magazine, a large library of books, and numbers of Golden Argosy and Harper's Weekly for stamps. Will exchange books at a bargain. A. I. ALLEN, 95 So. Broadway, Yonkers, N. Y.

Knight of Labor scarf-pin and a handsome watch-charm for a stylographic pen or a leather card-case. A sealing-wax initial stamp for the best offer of coins. GEO. C. HILL, 92 Hudson St., Boston, Mass.

Foreign and domestic postage and revenue stamps, Indian relics, stamp papers, coins, books, Confederate bills and newspapers for fossils and minerals. CHARLES E. FRICK, 1019 W. Lehigh Ave., Phila., Pa.

A foot-power printing press, 12x8, with type-cabinet, a fountain-pen, a box of tricks and a Waterbury watch for a collection of U. S. and foreign stamps. GEORGE W. VON UTASSY, Green St., Germantown, Pa.

5 vol. "Youth's Companion," 100 poultry papers, a set of boxing-gloves, a banjo, a pair of dumb-bells, 2 pairs of skates, coins and minerals for minerals, books, papers, etc. A. E. HAMMOND, P. O. Box 403, Willemantic, Conn.

Fossils, minerals, stamps, woods, botanical specimens, postmarks, alligators' teeth, seabeans, and fragmental Indian pottery for fossils, minerals, sea curios, Indian relics, or coins. F. E. WETHERELL, Box 353, Oskaloosa, Iowa.

Fine arrowheads, fossils and butterflies, for any or all of the following minerals: analcite, antimony, apatite, barite, biotite, chalcedony, cinnabar and opal, 2x2 or 2x3. WILL T. MILLER, P. O. Box 45, Parkersburg, W. Va.

A paper printed at Honolulu, Hawaiian Islands, for 40 different tobacco tags. 200 different fine postmarks for 60 different tags. Porcupine quills for 7 tags. Tag and stamp papers for 15 tags. PHILIP A. CRAPO, 513 N. 6th St., Burlington, Iowa.

Genuine Confederate money, curiosities, Chinese coins, small sea-shells, and valuable recipes for choice vegetable or flower seeds, remnants, embroideries, laces, writing paper, pens, silks, notions, etc. EXCHANGE, Box 188, Bridgeton, Cumberland Co., N. J.

Beetles, unnamed, and birds of western Oregon, for a good microscope. Will also exchange the same for specimens of copper, nickel, cobalt, bismuth, silver, gold and tin. Only first class specimens desired. AURELIUS TODD, Supt. Elk Head Mines, Elk Head, Oregon.

Fine specimens of albite crystals, actinolite xls, epidote xls, ripidolite, enstatite, red steatite, tourmaline xls, radiated tourmaline, argentine, halite, calcite, vermiculite, copper pyrites, etc., for fine fossils and minerals. Send list. JOHN C. GRAHAM, Willimantic, Conn.

❖ Archæology ❖

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

INDIANS OF NEW ENGLAND.

By JOHN J. ALTON.

PART I.

OF the prehistoric man of New England but little is known, and it is very difficult to obtain works on this subject. The Moundbuilders of the West seem to have completely overshadowed them, for works on this subject may easily be found in any library. We may ask why? Probably because they were a more intelligent race. The skill shown in the manufacture of their implements proves this. The design of many of their relics is even artistic, and they have raised numerous mounds as monuments in honor to their dead, and for various other purposes.

This is one thing which has attracted the archæologist, as they serve as beacons to guide him to the buried treasures of a once powerful, but now vanished race.

The New England Indian is far below him in intelligence, and his implements are of the rudest sort. He manufactured them simply as a necessary article, and showed but little skill, save in the implements of war. His arrow and spearheads are chipped as finely as those of the Moundbuilder, but he has built no mounds by which to mark his past existence (although a few scattered ones have been found in the States of Maine and New Hampshire, but these probably belonged to the true Moundbuilder), consequently the relics are scattered over a great surface, especially in the vicinity of lakes and streams, where they have remained hidden until brought to the surface by the busy plow.

Their pottery, pipes, etc., were very rude, generally made from some material easily worked, such as soapstone. This was a favorite substance, and all I have ever found were made from it. I have never

even seen a fragment of baked-clay pottery made by these Indians. Quarries from which the soapstone was taken have been found in various parts of New England, and one near the town of Millbury, Mass., seems to have been a huge pocket in the face of a granite ledge. The soapstone being removed, a perfect cave remains, seven feet in height, by nine in length.

Members of the Antiquarian Society of Worcester, Mass., intended to explore this cave, but permission could not be obtained from the owner. Numerous relics are said to have been found in its vicinity.

[TO BE CONTINUED.]

Mummies Found in Dakota.

FIVE SHRIVELLED BODIES DISCOVERED IN A CAVE IN THE BAD LANDS.

FIVE mummies were discovered in a cave in the Bad Lands of Dakota a few days ago, and were brought to St. Paul, Minn. Wm. Allen, a cowboy, was gold prospecting, and selected a location about the middle of the Bad Lands on the side of a mountain. He began sinking a shaft, and after getting down twenty-five feet deep discovered a cavern about twenty feet square which had once opened on the mountain side. He found huddled together in one corner of the cave five human bodies. The bodies were those of a man, woman, and three children. They were shrivelled to less than half the natural size, and the flesh was still on the bones, though as hard as that of Egyptian mummies. The hair was still on the heads, and the finger nails were perfect, and very long. When the bodies were brought to the surface the hair fell off, but the atmosphere had no other effect upon them.

The sides of the cave bore indications that the people had tried to dig out. The theory is that they took refuge there, and that a landslide or flow of lava from the mountain hermetically sealed the cave, leaving the prisoners to die of starvation. The body of the man bears marks on his side as though made by some sharp instrument, but no weapons or tools were found in the cave.

ZINC AND LEAD MINES OF JASPER COUNTY, MO.

By GEORGE D. STORY.

PART II.

THIS place is a perfect paradise for the mineralogist, as few places turn out more attractive minerals than these mines. Its Sphalerite, or Ruby Blende, is unsurpassed by that produced in any other part of the world. The following are a few of the minerals found here :

Sphalerite (zinc sulphide) is found both crystallized and massive. Crystals are obscure forms of the dodecahedron and octahedron. Cleavage, very perfect. Luster, adamantine to resinous, brilliant. Color, honey-yellow, brown, red, or black. In dark varieties the small crystals resemble garnet and cassiterite. Large, single crystals, from $\frac{1}{2}$ inch to 1 or 2 feet across (have been found larger) can sometimes be obtained, but clusters are more common. They occur in openings in the rock, and present a great variety of tints. There are several varieties of this mineral, all of which are very handsome, whether crystallized or massive.

Galenite (lead sulphide) occurs crystallized and massive. Crystals are in cubes and octahedrons. Cleavage perfect in three directions. Is by far the most important ore of lead. Very showy specimens.

Quartz Crystals occur in six-sided prisms, forming beautiful clusters.

Marcasite occurs in beautiful clusters of small green-colored crystals, having four sides terminating in a ragged end cut with gashes and having edges. Hard to procure in large specimens, generally occurring in patches or clusters on sphalerite, galenite, and flint, forming a striking and beautiful contrast.

Milky Quartz occurs in fine white masses and is very showy.

Porous Tufa occurs in porous masses, having the appearance of being burnt. Some specimens have crystals of sphalerite on them.

Flint.—There are several varieties of this

mineral, white, blue, mottled, and black and white stripes, resembling onyx (rare).

Compact masses of crinoid stems and limestone, and limestone in layers having small (fossil) bivalve shells (singular) also occur here.

Sludge blende is fine red zinc of brilliant luster, and is nice for ornaments.

Very frequently a person finds some rare mineral. A great feature of this place is the mixed specimens, having from two to five or six different minerals in the same piece, and are very beautiful and curious (a great deal better than single specimens).

Calcite.—Very attractive specimens of this mineral are found. It occurs massive and in dog-tooth crystals. Color, white and lemon-yellow to amber. Transparent to translucent. There have also been found large pieces containing drops of some liquid, but these are rare.

Specimens from these mines are in great demand and I have never had a complaint from any person to whom I have sent specimens.

THE END.

Natural Crystals of Magnesium Sulphate (Epsomite).

By P. DE ROUVILLE.

NATURAL crystals of natural magnesium sulphate, of more than 1 c. c. in length, were found coating the walls of a gypsum quarry in the department of Herault. The sulphate was in a constant state of exudation, and as it crystallized formed a lustrous coating over the gypsum. No explanation is given of its origin, but the rapidity of its formation and the size of its crystals renders it rather an interesting mineralogical phenomenon.

A CRYSTAL of black tourmaline from Sharpe's Township, Alexander Co., N. C., the new form $\frac{3}{2}R$ was detected. On xenotime from the same county 3P was found, and on herderite from Stoneham, Maine, the new plane P α

MINERALOGICAL CLUB

OF THE

NEW YORK ACADEMY OF SCIENCE.

THE sixth meeting of this Club was held at the residence of Prof. D. S. Martin, and was made interesting by a short lecture by Prof. Martin, on the formation of the rocks of New York Island and their associated minerals, and was illustrated by specimens from the collection of Mr. Braun and Mr. Hidden. During the evening Mr. Kunz exhibited the following specimens:

Nyrophane (called Magic Stone) from Colorado, that was opaque white, and when wet became transparent, revealing a photo or other object at the back. It absorbed one-half its weight or one-half its bulk of water. Some beautiful crystals and groups of crystals of hollow quartz. These are the most remarkable yet found and are identical in form with the Matanzas hollow calcite. An absolutely transparent cleavage rhombohedron of rhodocrosite, from the John Reed Mine, Colorado, and a specimen of magnetited muscovite (picture mica) found by him at 65th street and 4th ave., 13 years ago.

Mr. Hidden also exhibited the following: Brilliant rutile implanted on dolomite; emerald crystals from Stony Point, N. C.; the Whitfield Co. meteorite (5 lbs.), described by him in 1886; modified crystals of quartz from New York Island; a fine example of the blue indicolite from near 104th street and 4th ave., New York City; and two examples from the city that he had not yet been able to identify.

A very pleasant evening was passed and it was beyond doubt the most interesting meeting that has yet been held.

Among those present were E. A. Hutchin, W. E. Hidden, N. Arnold, E. D. Walker, G. F. Kunz, A. Bjerreguard, D. S. Martin, H. B. M. Fair, A. Shernikow, F. Braun, Wm. Niven, A. A. Cary, A. Chamberlain, J. Rosch, and T. D. O'Connor.

All mineralogists wishing to join this club should send their applications for membership to either Mr. George F. Kunz, at Tiffany's, New York City; Mr. B. B.

Chamberlain, 247 W. 125th St., New York City; or Prof. D. S. Martin, 236 W. 4th St., New York City.

All lovers of this science are invited to send in their applications for membership.

Crystalline System of Cryolite.

By DES CLOIZEAUX.

SINCE Krenner and Groth came to the conclusion that cryolite was monoclinic, and not triclinic, as stated by Websky and Des Cloizeaux, the latter has repeated his observation on two good crystals. All of his results support the view that cryolite is triclinic; the best evidence being the result of the observation in parallel light.

Corundum in Graphite.

By H. WICHMANN.

ON the surface of the graphite of Muhldorf, near Spitz, in Lower Austria, small crystals of corundum occur. The crystals attain a thickness of 0.5–6 mm., and a length of 7–15 mm. They are of a red to blue color, rarely gray, but always clouded with inclusions. The translucent crystals proved to be biaxial, with a rather large axial angle.

THE tin deposits of New South Wales are estimated by the Colonial geologists to cover an area of 5,440,000 acres at least.

GUFJARITE, a mineral hitherto only known to occur in Spain, has recently been discovered in a sample of ore from Machacamara, Boivlia.

PROF. DES CLOIZEAUX has recently observed 12 planes on the Phenacite from Colorado. Of these there is $\frac{1}{2}P2$ which is new for the specie.

A TWINNED crystal of molybdenite from Renfrew, Canada, suggests that this mineral may crystallize in the hexagonal system with its planes hemimorphically developed.

AND

LANDERO & CO., ENGINEERS,
P. O. BOX 34, GUADALAJARA, MEXICO.

◆ ◆ ◆

Any specimens from the following price-list are sent by mail post-paid.

[Faint handwritten notes at the bottom of the page]

LANDERO & CO., ENGINEERS.

P. O. BOX 34, GUADALAJARA, MEXICO.

WM. NIVEN,
DEALER IN
FINE MINERAL SPECIMENS
AND
OBJECTS OF ART AND GENERAL USE

MADE FROM
JASPERIZED WOOD, LABRADORITE,
CROCIDOLITE, CARNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, Etc., Etc.

A SPECIALTY MADE OF
JAPANESE CRYSTAL BALLS
OF ALL SIZES.

739 BROADWAY, NEW YORK.

TACOLUMITE, or Flexible Sandstone.
Specimens of this strange and interesting mineral from 15 to 50 cts. **ARTHUR CHAMBERLAIN**, 284 Pavonia Ave., Jersey City, N. J.

PHOTOS FOR GENTS ONLY.
Sure to suit. 2 for 10c., 6 for 25c., 12 for 40c. Address, **F. G. OSGOOD**, Ann Arbor, Mich.

Mineral collections of fine, showy minerals, from the celebrated Zinc and Lead mines of this locality. For advanced collectors, \$5 to \$10. Amateur collections, 10 cts. to \$4. Single specimens, 5 cts. to 75 cts. Price list for stamp. **G. D. STORY**, Cartersville, Mo.

SPHALERITE,
OR
RUBY BLENDE.

I have just received from
JOPLIN, MO.,
about 300 fine specimens of this beautiful mineral, which represent the

CREAM
of all the specimens taken from these celebrated mines, and will sell them at

25 Cents to \$2.00

a specimen. This is a rare chance to secure a fine specimen of this mineral cheap.

A. CHAMBERLAIN,
284 PAVONIA AVE., JERSEY CITY, N. J.

ARE YOU A COLLECTOR?

If so, send this same moment a good reference, and receive in return, one of my approval sheets of rare stamps, which are the best and cheapest in the market. 25 per cent. commission to agents.

LOOK AT THESE BARGAINS.

50 extra varieties of foreign stamps, 4 c.; 100 mixed, 3 c.; 250 mixed, 6 c.; 50 well mixed, including New Zealand, Cape of Good Hope, Mexico, New South Wales, Brazil, Chili, etc., only 10 c. Send for free price list. I will take good U. S. stamps, as Revenue, Departmentals, Postage, etc., in exchange. Write at once, don't delay. Address,

F. N. MASSOTH, Jr.,
Hanover Center, Indiana.

CINNABAR wanted in quantity. Address, quoting prices and quantity you can furnish, **A. CHAMBERLAIN**, Jersey City, N. J.

17 named minerals, 10 cts. 7 good named specimens, 1 x 1 inches, 15 cts. Minerals and eggs at cost, to quit business. A rare opportunity to buy. Price list free to customers. To others for stamp. **A. N. FULLER**, Lawrence, Kansas.

THE ARIZONA MINERAL COLLECTION.

PUT UP BY

MR. WILLIAM NIVEN,

Late Assistant-Commissioner, Arizona Territory.
World's Fair, New Orleans

ONLY 50 CENTS A BOX.

This is the most attractive collection that has yet been put in the market, and should meet with a large sale. It consists of 12 specimens packed in cotton in a partitioned box each accompanied by a printed list giving name of mineral, composition, etc., together with an engraving of the Natural Bridge, Chalcedony Park, Arizona Territory, which is made entirely of the wood of which this collection contains a piece.

A. CHAMBERLAIN,

284 Pavonia Ave., Jersey City, N. J.

A Buffalo Horn, post-paid, 50 cts.
A pair of same, post-paid, \$1.00.
A Buffalo Tooth, post paid, 10 cts.
St mps accepted, but coin preferred.
Price list of minerals free.

A. C. KENNEDY,
Blatchford, Custer Co., Montana.

MAZON CREEK FOSSILS.

Having about 200 of these celebrated Fossils which I wish to clear out, I am offering them at 15 c. each, 8 for \$1. **A. CHAMBERLAIN**, 284 Pavonia Ave., Jersey City, N. J.

VOL. II.

NO. 7.

MAY, 1887.

Price, 3 cents.

25 cents a year.

THE EXCHANGERS' MONTHLY

DEVOTED TO
Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| SUPERSTITIONS ABOUT OPALS, - - - - - | 49 |
| DIAMOND CUTTING, - - - - - | 50 |
| MILARITE, - - - - - | 50 |
| MINERALS FROM OBERWEISENTHAL, - - - - - | 50 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - - - - | 51 |
| EDITORIALS, - - - - - | 52 |
| HINTS, - - - - - | 52 |
| EXCHANGES, - - - - - | 53 |
| INDIANS OF NEW ENGLAND, - - - - - | 54 |
| HUMAN BONES OF ANCIENT TIMES, - - - - - | 54 |
| THE PLEASURES OF GEOLOGICAL RESEARCH, - - - - - | 55 |
| GOLD FROM BURMAH - - - - - | 55 |
| NEW YORK MINERALOGICAL CLUB, - - - - - | 56 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of STAR RIDERS and Cyclists in General.

E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE, East Rochester, N. H.**

Make Money Orders and Drafts payable to E. H. CORSON.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.



IF 3 CATS CAN CATCH 3 RATS IN 3 MINUTES,
HOW MANY CATS CAN CATCH 100 RATS IN
100 MINUTES. A humorous solution given in

THE Corona NEWS-LETTER

Issued every 2 weeks, 50 cents a year—Sample, 2 cts.
Address NEWS-LETTER, Corona, Bergen Co., N. J.

OPALES from Honduras. Specimens of this beautiful mineral, showing different shades of red and green, from 25 cents to \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

35 RARE CURIOSITIES, such as Perumed Palestine Wonder Stone, Porcupine Quills, Minerals, Rare Foreign Stamps, Tin Tags, Sharks Teeth, Birds Wings, Odd Coins, etc., many of which are very old and rare. no 2 alike, for only 25c. Send at once before all gone. Satisfaction guaranteed.

CURIOSITY CO., Box 308, Kennedy, N. Y.

OCCURRENCE AND FABRICATION OF Rock Crystal, with five illustrations, as contained in Nos. 1-4, Vol. II., of EXCHANGERS' MONTHLY, price 10 cts.

THE ARIZONA MINERAL COLLECTION.

PUT UP BY

MR WILLIAM NIVEN,

Late Assistant-Commissioner, Arizona Territory,
World's Fair, New Orleans

ONLY 50 CENTS A BOX.

This is the most attractive collection that has yet been put in the market, and should meet with a large sale. It consists of 12 specimens packed in cotton in a partitioned box, each accompanied by a printed list giving name of mineral, composition, etc., together with an engraving of the Natural Bridge, Chalcedony Park, Arizona Territory, which is made entirely of the wood of which this collection contains a piece. Each box contains:

FLUORITE.

FREE GOLD,

CHALCOCITE.

MALACHITE,

CHALCOPYRITE.

SMOKY QUARTZ,

NATIVE COPPER.

JASPERIZED WOOD.

AZURITE 'RYSTALS

'UPRITE ON LIMONITE

ARGENTIFEROUS GALENA.

ARGENTIFEROUS QUARTZ

For sale by

A. CHAMBERLAIN,

284 Pavonia Ave.,

Jersey City, N. J.

A SAMPLE SELF-INKING STAMP which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc., all mailed free for 50 cts (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

WE GUARANTEE YOU TO RECEIVE 500 Samples Books, Circulars, Letters and Papers **FREE** from firms all over the U. S. and Canadas if you send 20 cents to have your name in new issue of **AGENTS' NAME DIRECTORY**. Copy sent you with name inserted.

VERNON HILL, VA. Dec 27, '86

ALLEN & CO., GENTS:—I have already received more than the 500 parcels of mail, many News papers, etc., of which I had often paid 1 c. each before. I advise all to have their name inserted at once. I know from experience your directory far excels all others.

R T JAMES, Agent.

ALLEN & CO., Box 308, Fennedy, N. Y.

STAMP COLLECTORS!

Send 3c. stamp, and a promise to return in 10 days, and receive an A1 approval sheet of genuine stamps. Address, SCHIAFINO & CO., P. O. Box 74, Guadalajara, Mexico.

FOR SALE CHEAP.

Fine Indian Pipes, Stone and Flint Tools, Minerals, Fossil Ferns, Mounted Birds, Books, and Fine Fossil Fish. List for Stamp
O. D. WALLBRIDGE, Marseilles, Ill.

THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., MAY, 1887.

NO. 7.

SUPERSTITIONS ABOUT OPALS.

PART II.

SIR WALTER SCOTT is largely responsible for the present belief in the ill-luck of the opal. In his *Anne of Geierstein* he exaggerates and distorts its properties to heighten an uncanny element in the story, and to carry out this plot makes use of the supernatural. It can hardly be thought that he intended the fairy-tale opal to be taken seriously: nevertheless, such has been the case; and, while not accepting all that has been attributed to it, hundreds have closed the book with an uncomfortable feeling about the opal, which they could hardly throw off.

We find many tributes in classic literature to the opal. Pliny gives an account of a Roman senator named Nonnius who possessed a very beautiful opal, which was coveted by Marcus Antonius, who wished to make a gift of it to Cleopatra. But Nonnius persistently refused to part with the stone, and was finally outlawed on that account. He preferred exile with his beloved opal to life in Rome without it.

The opal is composed of silica and water. It forms, as a rule, short irregular veins in porphyry; but it is met with also in petrifactions of sandstone, and in the vesicular cavities of chalcedony. Most of the precious opals come from Czernowitza in Hungary; but unfortunately the principal vein

has recently been exhausted, and unless another is soon discovered, these stones will become exceedingly rare. The Mexican opal, or Hydrophane, is a transparent variety, which is occasionally found exhibiting a remarkably brilliant play of colors; but as water soon destroys their beauty, they have to be worn with great care, and consequently, are not desirable for ring stones. A moderate application of heat will sometimes restore the color to a hydrophane that has been spoiled by moisture, and it is probable that it is this stone that Walter Scott alludes to in his novel. The less valuable opals of commerce are known as the common opal, in which the colors are stationary, the hyalite, and the lignite.

A very curious and beautiful lot of opals was sent from Hungary, a few years ago, entirely black, and exhibiting a wonderful amount of brilliant colors; but, as several specimens suddenly disintegrated and crumbled into fragments in a most unwarrantable manner, it was speedily concluded that some other agency than unaided nature was responsible for the dusky color. There is an opal which comes from Australia that is almost black, but this is a conglomeration of the dark matrix so intermingled with the precious stone that it cannot be separated. Tongues and sparks of fire shoot out from most unexpected portions of these stones, and give them the effect of being in a state of combustion.

Occasionally a specimen of this Australian stone is met with in which the opal and the matrix lie in broad layers, and these

stones when cut in cameo produce a very beautiful appearance. One specimen of modern anaglyphic art, in a private collection, represents the head of a warrior. The helmet is in the most brilliant of opalescent colors: flames of green, yellow, and red sparkle from every part, while the delicate carving of the face appears in a soft ivory white, as if mellowed with age, and full of minute cracks. This is thrown into relief by the background, which is of dull black, without gloss, and the whole has the appearance of a rare antique.

THE END.

DIAMOND CUTTING.

By VICTOR.

THE year 1858 signalized the introduction of the art of cutting diamonds in this country. It was then that Henry D. Morse, of Boston, displayed his skill, since which time many workshops have been established in America. It is a curious fact that diamonds in the rough may be imported free of duty, but an exceedingly heavy duty is imposed on this jewel when cut. The modern process of cutting diamonds is much the same as the old. The workmen in this art command as high wages as a first-class jeweler. Mr. Morse has a machine of his own invention which he uses and which he believes is an improvement on the old method. He mounts two diamonds in a sort of double lathe, using one against the other. This is a close imitation of the old hand method, in which the diamonds are cemented each at the end of a stick or handle, and rubbed together with a strong pressure. Of course, more or less dust results from such a process. This dust is called boor and is used in cleaning and polishing diamonds. Small chips of this jewel, which come off in cleaving, are used in diamond clusters and for the eyes of birds or animals. It is not always the largest diamond that is the most valuable. A smaller stone of great brilliancy is far superior to a larger one of a dull appearance. Consequently great care should be exercised in

the cutting of this stone. One lapidary may on the first cutting produce no brilliancy. The diamond is then given to a more skillful workman who, perchance, makes it a most brilliant one. When Mr. Morse cut his big Virginia diamond in Boston in 1859, most jewelers doubted the possibility of cutting diamonds in this country. But gradually the inevitable law of trade asserts itself, and so profitable a business could no longer be monopolized abroad. There are about a hundred workmen now employed in New York City alone in cutting diamonds, and their wages average about \$25 a week. There is also a process of burning diamonds which was described in the January number of the MONTHLY and need not be mentioned here.

Milarite.

By E. LUDWIG.

FORMER a lysis of this mineral differed so greatly that Ludwig considered it desirable to make a new analysis. The results are as follows, viz.:— SiO_2 71.81, Al_2O_3 10.67, CaO 11.65, K_2O 4.86, H_2O 1.36, from which the formulæ $\text{Si}_{12}\text{Al}_2\text{Ca}_2\text{KHO}_{30}$ is deduced. Tschermark determined the physical properties of milarite, and found each crystal to be built up of at least six individuals, which are united together in three different directions, at about 120° ; consequently the crystals resemble the trilling crystals of aragonite and witherite. The twin plane is α P, and all the results obtained by Tschermark showed that milarite is rhombic and not hexagonal.

Minerals from Oberweisenthal.

By A. SAUER.

In the nepheline-basalt of the Oberweisenthal eruptive mass, Saxony, there occur augite, haryne, titaniferous mica, hornblende, peroffskite, leucite, and pseudomorphs of analcite after leucite. In the phonolite is found sanidine, augite, haryne, melanite, and hornblende. In the leucitophyre, pseudomorphs of sanidine and mica after leucite are found.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART VII.

TRIP TO STERLING HILL. WE ATTEND PRAYER MEETING AND NEARLY GET BOUNCED.

By the time the second bell rang we were all ready for breakfast, and there was a broad smile on all of our faces as we entered the dining room, but no reference was made to the previous evening's escapade.

After breakfast we decided to spend the day examining the rocks along the railroad between Franklin and Sterling Hill and to make a preliminary survey of the hill.

We started about eight o'clock and made our way to the depot, near which lay a pile of rocks, which we set to work examining. The only result of our labor, however, was a fine specimen of foliated graphite and some interesting specimens of hornblende. All the way to Sterling Hill we found nothing but white limestone with foliated graphite in round pieces ranging in size from a quarter of an inch to an inch in circumference. In fact the whole rounded seemed to be one solid mass of limestone.

By the time we reached Sterling Hill we were hungry enough to enjoy the lunch we had brought with us. So having selected a shady spot on the side of the hill where we could overlook the surrounding country, we were soon stowing away such specimens as the inner man delights in having.

Sterling Hill is situated about a mile and a half below Franklin in the village of Ogdenburg, and lies west of the railroad, being about a quarter of a mile from the station. The history of the mine at this hill is similar to that of Mine Hill, except that the ore not being as rich as at Mine Hill, the mine has not been worked for three years.

The ore taken from this mine, however, makes much handsomer cabinet speci-

mens, on account of its being associated with zincite of a bright red color.

It is also a good locality for calc-spar, of a delicate pink, rose, and salmon color, which is easily broken into perfect rhombs.

After dinner we set off in search of the calamine mine. We found it not a great ways off, but as we had already been informed that the deposit had been entirely exhausted, we did not expect to find much. We found an excavation about 100 feet deep and 500 feet in circumference and almost entirely overgrown with grass. At the bottom we found the entrance to the mine in shape of a square hole partly covered by boards and into which we nearly fell as we ran down the sides of the excavation. There was not much to be found here, but we loaded up with the best of the calamine we could find at the old dump, and as it was then after five o'clock and we were quite a distance from the depot, we turned our steps homeward.

We reached the depot at Ogdenburg in time for the six o'clock special which soon landed us in Franklin. The farmer was waiting for us and took charge of our satchels, greatly to our relief.

The evening passed uneventfully, except that we decided to make another trip to Sterling Hill on the morrow. We met with our first disappointment the next morning as, when we got up, we found it raining. We decided, however, to make use of the day by packing and sending off the minerals we had already secured.

So after breakfast we repaired to the barn and set to work sorting, wrapping, packing, and marking, and by noon we had them all packed and marked ready for the farmer to take to the station, which he did the same afternoon. By this time it had stopped raining, but we decided to rest for the afternoon, so we spent it playing cards, dominoes, and any game we could lay our hands on, and in the evening we astonished the country folks by attending prayer-meeting at the school-house, which was a small brick building having but one room, with eight benches, four on each side, with a desk and chair in front.

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year.....\$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch......50

Per Column.....2.75

Per Page.....5.00

Liberal discount on standing ads.

Nothing less than a half-inch ad. taken.

Advertisements must be in by the 20th, and exchanges by the 15th of the month to insure insertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

Look out for the first instalment of a
"Talk About Minerals," by A. K. Bates.

We will again have to ask those of our friends who use the Exchange Column to condense their notices to about twenty-five words as our space is too limited to insert longer notices. We ask pardon of those whose notices we have left over.

We return thanks to Mr. J. Kost, M.D., LL.D., for a copy of his First Geological Report of Florida, dated March 2d, 1887. It is very interesting and we hope he will induce the authorities to furnish the money needed to continue the work.

We have received from Mr. George H. Cook, State Geologist of New Jersey, a copy of his report for 1886, for which we return thanks. There are few States which are having a more exhaustive geological survey made of them than the State of New Jersey. The work has been carried on since 1854 and a report is published every year. The report just received consists of 254 pp., one uncolored and 3 colored maps, and 37 illustrations.

→ HINTS ←

Use your specimens for study, not for ornaments.—T. S. ASH.

PATRONIZE those papers having exchange columns.—C. S. MASON.

TETRAHEDRAL crystals are possible in the tetragonal, hexagonal, and isometric systems.—T. S. ASH.

HEMIHEDRAL forms are not possible in the triclinic system, as that system is without plane of symmetry.—T. S. ASH.

EMBEDDED fluorites are rarities. They occur at Evigtok, in cryolite, and at Kongsberg, Brevig, in calcite.—T. S. ASH.

A TULIP, grape, or any other large leaf, if rolled up into a funnel shape, is handy when no cup has been brought along.—C. S. MASON.

SELECT some certain mineral and study all about it. Collect every form of it that can be found. Good subjects may be found in quartz, copper, calcite, pyrites, etc.—C. S. MASON.

SMALL and single specimens may be sent safely through the mail by putting them in an auger-hole bored in a piece of soft wood. They may be wrapped in cotton as an additional security.—C. S. MASON.

SIMPLE TEST FOR GOLD.—Take a piece of flint and rub against it the metallic object to be tested, until the latter leaves a sufficiently marked trace upon the stone. Upon bringing the flame of a sulphur match in contact with the spot, the latter will remain intact if it has been made with gold, but will disappear if the contrary be the case.—
LA SCIENCE EN FAMILLE.

MANY of the younger collectors make this mistake. When asking of miners if a certain mineral is to be found, call it by its technical name. They should call it by its common name. Many miners call pyrite sulphur diamonds or simply diamonds. Clear quartz crystals also come under this head. Pyrite is also called mundig; manganese, graphite; kaolin, white clay; yellow and red ochre, yellow and red clay, etc.—C. S. MASON.

Exchanges

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

Indian relics for U. S. coins. Send list. H. T. UPSON, Parkersburg, W. Va.

Fine Indian arrowheads to exchange for old U. S. coins. W. P. RATHBONE, JR., Box 483, Parkersburg, W. Va.

Fine arrowheads and minerals for every U. S. half-cent sent me. WILL T. MILLER, Box 45, Parkersburg, W. Va.

Many U. S. cents from 1795 to 1856 for coins not in my collection. C. T. TATMAN, 93 Piedmont Street, Worcester, Mass.

Tin-tags for minerals or minerals and curiosities for the same. Send list. F. S. FOOTE, 385 Lyon St., Grand Rapids, Mich.

Select cabinet minerals, large and many of them rare, fine South Sea Island shells and curios, for fine minerals. E. H. HARN, Box 51, Blairsville, Penn.

For exchange, fossil sharks' teeth and tertiary fossils generally. Also recent marine shells. J. KOST, Office of State Geol. Survey, Tallahassee, Florida.

I will exchange coins, Indian arrowheads and books, for U. S. coins, old books, crystals, Indian relics and autographs. J. E. M. WILLIS, Eliot, York Co., Mo.

A collection of about 1500 tobacco tags for the best offer of printing material or stamps with or without album (former preferred). A. K. BATES, Titusville, Pa.

Twenty-five kinds of tobacco tin-tags and twenty-five kinds of foreign stamps for best offer in minerals. W. A. ARNOLD, Lock Box 4, Willimantic, Ct.

I will exchange good flint nodules, singly or in quantity, satins (for fancy work), etc., for good relics of the stone age. Mrs. ELLA F. BOYD, Box 207, Hyde Park, Mass.

I will give 20 different species of wood for the best offer of arrowheads, 2 spearheads, or an Indian grooved axehead. OSCAR M. HEISS, 956 Shackamaxon St., Phila., Pa.

Books on chemistry, botany, natural history, etc., for a printing press and outfit or minerals. Also stamps and minerals for same. E. J. SMITH, Box 70, Portsmouth, Ohio.

I have some very rare minerals to trade for coins, stamps and fractional currency. Also 20000 sea shells and mounted specimens of sea moss and sea weeds for stamps, coins, and good offers. W. P. ARNOLD, Shannock, R. I.

Porcupine quills for tin-tags. Tin-tags for same. Send list. PHILIP A. CRAPPA, 613 N. 6th St., Burlington, Iowa.

Fine and rare minerals to exchange for the same. All communications answered. EZRA R. LARNED, 50 24th St., Chicago, Ill.

An aquarium with bronze base, 10x14½ in., for large crys. specimens or cabinet-sized nodules. Correspond first. NELLA A. CHURCH, Englewood, Ill.

Will exchange 25 minerals 10 Indian axes, 60 arrowheads, 5 Moundbuilders' tools, fossils, etc. for U. S. stamps of any kind. F. N. MASSOTH, JR., Hanover Center, Ind.

Fine minerals in exchange for others not in my collection. Bolton and Roxboro minerals a specialty. Cabinet size specimens wanted and given. G. L. BRIGHAM, Bolton, Mass.

Complete directions for making and using a hektograph or copying-pad which prints 50 to 100 circulars from one writing, for 15 var. of rare stamps. E. D. MELVILLE, Chester, Pa.

A zither, 200 postmarks, 800 tin-tags, 40 copies Youth's Companion, 10 copies of stamp papers and a stamp album to exchange for stamps. G. W. VON UTASSY, Germantown, Phila., Pa.

Fine sets of eggs for a copy of Davies Egg Check List and Key to the Nest and Eggs of North American Birds, second edition, or printing outfit with rubber type. G. H. HENRY, Bonaparte, Iowa.

Agate, actinolite, antholite, aragonite, ankerite, asbestos, arsenopyrite, barite, basanite, blende, calamine, etc., for fine minerals or scientific instruments. T. J. LEWIS, 710 N. 22d St., Phila., Pa.

Fine minerals and curios for others. 1 vol. Harper's Young People, philatelic, mineral, etc., papers, for minerals. V-nickels without cents for minerals. JOSEPH BOSLER, JR., Box 74, Carlisle, Pa.

Munson's Complete Phonography and 1 year of Phonographic News, and 75 different newspaper headings for books, instruments or specimens of Natural History. A. A. HALSEY, Water Mills, Suffolk Co., N. Y.

15 ink recipes or a recipe to make rubber hand stamps, stamping ink and pads, or a recipe to etch upon glass and how to bore holes in glass for any dime on or before 1860. W. C. SPAYDE, Steelton, Dauphin Co., Pa.

Kieserite, danburite, crys. native copper, chloropal, sylvite, beryl, crocidolite, manganite, and other fine minerals in exchange for same. Also a few sets of eggs for same. ED D. DROWN, Weldon, Mont. Co., Pa.

An elegant specimen of asbestos for a copper cent dated before 1835, or any 2 after that date. Coins and books to exchange for printing press and outfit. No postals. WM. J. BUCKLEY, 125 Greenwich St., N. Y. City.

✧ Archaeology ✧

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

INDIANS OF NEW ENGLAND.

By JOHN J. ALTON.

PART II.

ANOTHER very interesting curiosity of this kind was found years ago near the town of Brookfield, Mass. Along the face of a high ledge was hollowed out numerous mortars. When first discovered pestles of stone were found in some of them. These mortars were about breast high from the ground, and were probably considered by the Indians as a great improvement over the other form.

On the road to Oxford, Mass., a short distance from the town, may be seen a small granite shaft, upon which is cut a tomahawk and a cross. Under this is the simple inscription,

J. J.
1695
...

This monument was erected where once stood the cabin of John Johnson. He was a Huguenot, and with his wife and three children fled from their home in France, and came to seek a home in the wilds of New England. Here in the wilderness and miles away from any civilization they built their cabin. But the unfortunate family was doomed. During the winter of 1695 they were attacked by Indians while the husband was away. The wife succeeded in concealing herself and afterwards escaped. But she was obliged to witness the cruel work of the Indians, who dashed out the brains of her three children on the stone jamb of the fire-place (this very stone is still in existence, and is bolted to the underpinning of the town-hall at Oxford). The Indians, after plundering the house, lay in ambush for the husband, and killed him when he returned.

This little incident will give one an idea of the nature and characteristics of these Indians. No, may I ask, "Did these Indians belong to the same race as the Mound Builders?"

[THE END.]

Human Bones of Ancient Times.

HUMAN remains, which apparently belong to the age of the mammoth and rhinoceros, have been discovered in a Belgian cave. The discovery has been made by M. Marcel de Puydt and Sohest in the grotto of Riche-aux-Roches, near Spy, in the Province of Namur. The floor of the cave consists of a layer of brown clay, which contained a skull of comparatively recent age. Under this was a bone bed of calcareous tufa containing remains of the elephant and a species of deer, and flint weapon, showing traces of use. Under this bed was a second layer of ossiferous earth, containing remains of rhinoceri and deer, and rich in flints, bone implements, ivory plates of the mammoth tusk carved with rude figures, and fragments of pottery, including the bottom of a vase of regular form and baked. Beneath this bed was a other layer of brown clay with numerous bony fragments. Here, at from five to six meters from the entrance to the cave, two human skeletons were found in a natural position, and probably entombed there. Along with the skeletons were found other objects, such as have been mentioned above. Under this bed was the barren carboniferous limestone rock. The characteristics of the skulls approached were, for the most part, those of inferior races, and the other bones found seemed to indicate a race of short men. The conclusion drawn from the discovery by M. Nadaillac is that the Neanderthal race of men, who were persistent through the ages, even to the present day, without being incompatible with a very marked intellectual development, once lived on the banks of the Meuse in most remote times, working the flint, utilizing the bones of animals and the tusks of the mammoth, making and firing vases of clay, etc.

THE PLEASURES OF GEOLOGICAL RESEARCH.

By ARON HAMBURGER.

Of all the natural sciences, the study of Geology is found to be one of the most fascinating. We can hardly imagine anything more pleasant than a trip in the spring, or autumn, to the cliffs or quarries, in search of geological study and specimens.

Our knowledge of the fauna and flora of antediluvian times is, for the most part, derived from the history of their existence as we read it in the rocks.

Were it not that mammoth skeletons of great mammals and birds were found at different periods of the world's history, perhaps to this day we would remain in ignorance of their existence. Aside from the information gained by its study—geology is highly interesting.

Mineralogy, the great science allied to geology, is a beautiful and wonderful study. In these sciences, as in chemistry, things do not merely occur by chance, but one universal law governs the whole. In a few words, they are exact sciences.

We cannot look upon the regular and exact geometrical form of a quartz crystal without seeing the wisdom and power of the Creator reflected in His natural laws.

The mineral kingdom of nature furnishes many beautiful and useful substances. We often observe beautiful rings of gold set with varied-colored gems. The most beautiful gem or most valuable jewel traces its origin from the humble bosom of Mother Earth.

Our knowledge of the kindred sciences—Geology and Mineralogy greatly aids us in our search for the useful metals with which the earth is replete. We think it far better for a boy to spend his time in collecting and labeling minerals and rocks, than to read those cheap works of fiction, so often published under the caption of "Texas Jack, the Terror of Roaring Gulch." These novels cost him five and ten cents each, without counting the damage done to his soul, while he could be learning useful lessons from nature.

Gold from Burmah.

By R. ROMANIS.

THE samples were found on the banks of the Meza, a tributary of the Irrawaddi, about 30 miles from the latter river, and to the westward of Katha.

SAMPLE A. Large irregular fragments with quartz embedded in some of them. Iridosmine and crystals of chrome iron can be separated under a microscope. The composition is given below. The silver ore is a grey mineral which loses 49 per cent., on ignition.

SAMPLE B. —Fine, smooth grain; about 17 per cent. insoluble in aqua regia; the insoluble matter consists of quartz, zircon, and about 7 per cent. of iridosmine in bright, flat grains mixed with a black mineral, apparently a platinum ore.

A.

| | |
|-------------------------------|-------|
| Gold | 87.66 |
| Silver | 5.96 |
| Gangue : | |
| Copper pyrites | 1.95 |
| Quartz | 1.09 |
| Magnetic oxide of iron, | 0.32 |
| Silver (? ore) | 1.54 |
| Loss on Ignition..... | 1.48 |

B.

| | |
|-----------------------------------|-------|
| Gold | 74.83 |
| Silver | 2.86 |
| Platinum | 2.53 |
| Iridosmine | 7.04 |
| Zirconia | 7.08 |
| Silica (by diff.)... | 5.66 |
| Magnetic oxide of iron, a little. | |



Free Iodine in a Mineral Water.

By J. A. WANKLYN.

THE water from Woodhall Spa, near Lincoln, is exceptionally rich in bromides and iodides, and, moreover, contains iodine in sufficient quantity to give it a brown tint. On agitating it with carbon bisulphide, the water is decolorized, the bisulphide becoming violet.

PROF. G. A. KOENIG, of the University of Penn., has recently described a manganese zinc serpentine from Franklin, N. J.

NEW YORK MINERALOGICAL CLUB.

THE seventh meeting of this Club was held at the residence of Mr. W. H. J. Sieberg, on Tuesday evening, March 29, 1887, and was to have been devoted to organization, but the committee was not ready to report, but promised to be ready by next meeting. During a discussion on organization it was unanimously decided to suggest to the committee the name "New York Mineralogical Club," and after organization to see if it could not be made a branch of the Academy of Sciences.

An interesting feature of the meetings have been the specimens exhibited by the different members, together with a description of their peculiarities and localities. Each meeting increases the number of specimens exhibited, so that our limited space will only permit a very brief description of them.

Mr. Kunz exhibited a cut amethyst from Deer Hill, Oxford Co., Maine, which is said to be the deepest-colored gem ever taken from this place. Some monazite sand from Brazil, S. A., which was beautifully phosphorescent on heating, and would perhaps be used extensively. It resulted from the decomposition of a granitic rock, and the bed of a creek was lined with it.

Mr. Hidden exhibited the casts of two iron meteorites one of which fell on January 23, 1870, at Nadagalla, India, and the other at Rowton, England. Also a specimen of Hanksite from Nevada, and a specimen of xenotime from Alexander Co., North Carolina.

Mr. Bjerreguard, a specimen of cubo-octahedrons of iridescent pyrite, with calcite crystals exhibiting — $\frac{1}{4}$ R, O, — 24R?,

16R?, $\frac{1}{2}$ 2, from the Croton Aqueduct shaft 32. The — $\frac{1}{4}$ R is striated parallel to $\frac{1}{4}$ R in all the crystals. Also a massive red feldspar, with no trace of crystallization or cleavage, from 100th St., N. Y. City, and a silky tremolite from Spuyten Duyvil.

Mr. Niven, a fine large crystal of apophyllite, with analcite crystals, from the Erie Tunnel, Bergen Hill, and a speci-

men of crystallized translucent proustite.

Mr. B. B. Chamberlain, a radiated and a globular stilbite with harmatone and chlorite from 4th Ave. and 95th St., a stilbite from Bergen Hill and one from Tarrytown.

Mr. Sieberg a specimen of white pyroxene from Inwood, picture (magnetic) mica from Riverside Drive and 90th St., and quartz from the Rhine.

Mr. Braun exhibited a number of interesting specimens, among which was a piece of black slate with a narrow white vein of quartz containing gold from California.

Mr. A. Chamberlain, a specimen of transparent and colorless crystals of prehnite from Tillie Foster Mine, Brewster, N. Y.

After the meeting Mr. Sieberg invited all present to partake of a fine collation which was enjoyed by all. There were sixteen members present.

All mineralogists wishing to join this club should send their applications for membership to either Mr. George F. Kunz, at Tiffany's, New York City; Mr. B. B. Chamberlain, 247 W. 125th St., New York City; or Prof. D. S. Martin, 236 W. 4th St., New York City.

All lovers of this science are invited to send in their applications for membership.

Hetarrolite.

By C. MOORE.

THIS mineral occurs in botryoidal radiofibrous masses, always accompanying chalcopyrite in brown iron ochre, at the Passaic zinc mine, Sterling Hill, N. J. Hetarrolite is black, has a semi-metallic luster, a brownish black streak, infusible before the blowpipe, and evolves water on being heated in a closed tube, H. 3, sp. gr. 4.933. Its chemical composition corresponds with the formulæ ZnO , MnO , MnO_2 , whence it appears to be a zinc-hausmanite.

TEACHER (in mineralogy class).—Johnny, give me the name of the largest known diamond.

JOHNNY.—The ace.

MEXICAN MINERALOGICAL OFFICE

AND

→ LABORATORY → FOR → ANALYTICAL → CHEMISTRY, →

LANDERO & CO., ENGINEERS,

P. O. BOX 34, GUADALAJARA, MEXICO.

♦♦♦♦♦

Large stock of Minerals for sale. Correspondence received in Spanish, English, French, Italian, Portuguese, and German, and promptly attended to.

TERMS:—Cash with orders. Satisfaction guaranteed, or money refunded. Remittances can be made by bank draft or money order payable in New York. U. S. postage stamps of current issue and low denominations, unused, clean, and not stuck together, accepted same as cash.

Any specimens from the following price-list are sent by mail post-paid.

| | | | |
|-------------------------|--------------|-----------------------------------|--------------|
| Analcite..... | \$.10 to .50 | Graphite..... | \$.10 to .20 |
| Ammonogen..... | .10 to .20 | Gypsum, xls..... | .50 to 1.00 |
| Amethyst..... | .05 to .50 | Satin spar..... | .05 to .25 |
| Amianthus..... | .05 to .20 | Selenite..... | .05 to .25 |
| Andalusite..... | .20 to 1.00 | Hematite..... | .05 to .50 |
| Anglesite..... | .20 to 1.50 | Heu andite..... | .30 to 1.50 |
| Antimony..... | .10 to 1.00 | Idocrase..... | .10 to .30 |
| Apatite..... | .15 to 2.00 | Lazulite..... | .50 to 2.00 |
| Apophyllite..... | 1.00 to 3.00 | Lepidolite..... | .15 to .50 |
| Argentite..... | .50 to 1.50 | Limonite..... | .05 to .50 |
| Asphaltum..... | .03 to .20 | Magnetic pyrites..... | .15 to .30 |
| Autunite..... | .15 to .50 | Magnetic sand (titaniferous)..... | .05 |
| Azurite..... | .10 to 4.00 | Magnetite..... | .05 to .30 |
| Barite..... | .05 to 1.00 | Malachite..... | .10 to 1.00 |
| Beryl..... | .10 to .50 | Margarite..... | .25 to .50 |
| Blotite..... | .15 to .50 | Menaccandite..... | .30 to .60 |
| Bismuth..... | .15 to .50 | Mesolite..... | .25 to 1.00 |
| Blende..... | .10 to 1.00 | Mispickel..... | .10 to .25 |
| Bornite..... | .05 to .50 | Molybdenite..... | .15 to 1.00 |
| Calcite, xls..... | .25 to 1.00 | Natron..... | .05 to .15 |
| Calc spar..... | .05 to .15 | Obsidian (fine shades)..... | .05 to .20 |
| Mex. onyx..... | .05 | Opal, precious..... | 1.00 to 5.00 |
| Do. pol. one side..... | .20 | Opal, milky..... | .10 to .50 |
| Do. pol. object..... | .50 to 3.00 | Opal, Hyalite..... | .30 to 1.00 |
| Cancrinite..... | .10 to .50 | Opal, semiopal (dif. shades)..... | .05 to .20 |
| Carnelian..... | .10 to .50 | Onyx-opal..... | .15 to 1.00 |
| Cassiterite..... | .10 to 1.00 | Onyx (quartz)..... | .10 to .50 |
| Celestite..... | .25 to 1.00 | Prehnite..... | .15 to 1.00 |
| Cerargyrite..... | 1.00 | Psilomelane..... | .05 to .20 |
| Cerussite..... | .20 to .50 | Pyrrargyrite..... | .50 to 3.00 |
| Chalcedony..... | .10 to .50 | Pyrite..... | .10 to 1.00 |
| Chalcocite..... | .10 to 1.50 | Pyrolusite..... | .10 to .50 |
| Chalcocyprite..... | .05 to .50 | Quartz, xls..... | .05 to 1.00 |
| Chrysocolla..... | .15 to .50 | Quartz, Jasper..... | .05 to .20 |
| Chrysolite..... | .05 to .60 | Quartz, Silicified Wood..... | .10 to .50 |
| Cinnabar..... | .30 to 1.50 | Rhodonite..... | .10 to 1.00 |
| Columbite (Niobit)..... | .10 to 2.50 | Rubellite..... | .15 to .50 |
| Copper..... | .10 to 2.00 | Silver..... | .25 to 1.50 |
| Corundum..... | .25 to 1.00 | Sodalite..... | .15 to .50 |
| Crocidolite..... | .75 | Sphene..... | .15 to 1.00 |
| Crocoite..... | 1.00 | Sulphur..... | .05 to .20 |
| Cryolite..... | .15 to .50 | Trydimite..... | .30 to 1.00 |
| Cuprite..... | .20 to 2.00 | Triplite..... | .15 to .50 |
| Cyanite..... | .10 to .30 | Vivianite..... | .10 to .40 |
| Fluorite..... | .05 to 1.00 | Wad..... | .05 to .50 |
| Galenite..... | .05 to .50 | Zircon..... | .05 to 1.00 |
| Gold..... | .50 to 1.00 | | |

♦♦♦♦♦

Address.

LANDERO & CO., ENGINEERS,

P. O. BOX 34, GUADALAJARA, MEXICO.

WM. NIVEN,
DEALER IN
FINE MINERAL SPECIMENS
AND
OBJECTS OF ART AND GENERAL USE

MADE FROM
JASPERIZED WOOD, LABRADORITE,
CROCIDOLITE, CORNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, Etc. Etc.

A SPECIALTY MADE OF
JAPANESE CRYSTAL BALLS
OF ALL SIZES.

739 BROADWAY, NEW YORK.

TACOLUMITE, or Flexible Sandstone.
Specimens of this strange and interesting mineral from 15 to 50 cts. **ARTHUR CHAMBERLAIN**, 284 Pavonia Ave., Jersey City, N. J.

PHOTOS FOR GENTS ONLY
Sure to suit. 2 for 10c., 6 for 25c., 12 for 40c. Address, **F. G. OSGOOD**, Ann Arbor, Mich.

Mineral collections of fine, showy minerals, from the celebrated Zinc and Lead mines of this locality. For advanced collectors, \$5 to \$10. Amateur collections, 10 cts. to \$4. Single specimens, 5 cts. to 75 cts. Price list for stamp. **G. D. STORY**, Cartersville, Mo.

SPHALERITE,

OR

RUBY BLENDE.

I have just received from

JOPLIN, MO.,

about 300 fine specimens of this beautiful mineral, which represent the

CREAM

of all the specimens taken from these celebrated mines, and will sell them at

25 Cents to \$2.00

a specimen. This is a rare chance to secure a fine specimen of this mineral cheap.

A. CHAMBERLAIN,

284 PAVONIA AVE., JERSEY CITY, N. J.

FINE MINERALS CHEAP.

Iron Geodes, 5 to 75c.; Elba ore, 10c.; hydrozincite, 15 to 50c.; greenochite, 10 to 50c.; small pieces on cards, 10c.; zinc blende, 10 to 50c.; limonite in nodules, fibrous, and with fine black surface, 5 to 50c.; goethite, 5 to 30c.; limestone and calcite, showy, 5 to 25c.; fibrous asbestos, 5 to 25c.; asbestos in calcite, 5 to 25c.; kaolin, 5 to 15c.; steatite, 5c.; red granite, 10c.; quartz, 5 to 25c.; mica, 5c.; flint, 5c.

Small but showy pieces of all the above, 50c. On all orders over \$2, 5 per cent. commission allowed. Express paid on all orders of \$4 or over. Large specimens for schools and colleges at reduced rates. **CHAS. S. MASON**, 13 S. College St., Easton, Pa.

MINERALOGISTS, GEOLOGISTS, ARCHÆOLOGISTS, AND ALL COLLECTORS OF NATURAL HISTORY SPECIMENS.

The label herewith illustrated is very neat and useful, it being printed on tinted card board.

PRICES.

100, 25c.; 500, 75c.; 1000, \$1.25.

Send money by postal note, one or two-cent stamps, or small amounts in silver (wrap the silver in paper). Address,

THE CHAMBERLAIN PRINTING CO.,
284 PAVONIA AVE., - - - JERSEY CITY, N. J.

| |
|----------------|
| No. |
| Name |
| REMARKS |
| LOCALITY |

JUNE, 1887.

THE

Price, 3 cents.

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|--|----|
| A TALK ON MINERALS, - - - - - | 57 |
| SYLVITE, - - - - - | 58 |
| HAIRYOTOME, PHILLIPSITE, STILBITE, - - - - - | 58 |
| COLUMBITE FROM COLORADO, - - - - - | 58 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - - - - | 59 |
| NEW YORK MINERALOGICAL CLUB, - - - - - | 60 |
| CONSTITUTION AND BY-LAWS OF THE N. Y. MIN. CLUB, - - - - - | 60 |
| THE STONE AGE IN NEW YORK, - - - - - | 62 |
| A GOLDEN NUGGET, - - - - - | 62 |
| A VISIT TO THE PERKIOMEN COPPER MINES, - - - - - | 63 |
| SARKINITE, - - - - - | 63 |
| POLYARSENITE, - - - - - | 63 |
| EXCHANGES, - - - - - | 64 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.

WM. NIYEN,
DEALER IN
FINE MINERAL SPECIMENS
AND
OBJECTS OF ART AND GENERAL USE
MADE FROM
JASPERIZED WOOD, LABRADORITE,
CROCIDOLITE, CARNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, Etc., Etc.

A SPECIALTY MADE OF
JAPANESE CRYSTAL BALLS
OF ALL SIZES.
739 BROADWAY, NEW YORK.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of STAR RIDERS and
Cyclists in General.

E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE, East Rochester, N. H.**

Make Money Orders and Drafts payable to E. H. CORSON.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.

Mineral collections of fine, showy minerals, from the celebrated Zinc and Lead mines of this locality. For advanced collectors, \$5 to \$10. Amateur collections, 10 cts. to \$4. Single specimens, 5 cts. to 75 cts. Price list for stamp. G. D. STORY, Carterville, Mo.

PHOTOS FOR GENTS ONLY.
Sure to suit. 2 for 10c., 6 for 25c., 12 for 40c. Address, F. G. OSGOOD, Ann Arbor, Mich.



IF 3 CATS CAN CATCH 3 RATS IN 3 MINUTES,
HOW MANY CATS CAN CATCH 100 RATS IN
100 MINUTES. A humorous solution given in

THE Corona NEWS-LETTER

Issued every two weeks. 50 cents a year—Samples, 1 cts.
Address NEWS-LETTER, Corona, Bergen Co., N. J.

MONEY

Made easy. Manufacturing Rubber Stamps. Send for Price List of Outfits, to J. F. W. Dorman, No. 217 East German Street Baltimore, Maryland, U. S. A.

WE GUARANTEE YOU TO RECEIVE 500
Samples Books, Circulars. Letters and Papers FREE from firms all over the U. S. and Canadas if you send 20 cents to have your name in new issue of **AGENTS' NAME DIRECTORY**. Copy sent you with name inserted

VERNON HILL, VA., Dec 27, '86
ALLEN & Co., GENTS:—I have already received more than the 500 parcels of mail, many Newspapers, etc. of which I had often paid 10c. each before. I advise all to have their name inserted at once. I know from experience your directory far excels all others.
R. T. JAMES, Agent

ALLEN & CO., Box 308, Kennedy, N. Y.

A SAMPLE SELF-INKING STAMP
which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc. all mailed free for 50 cts (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

STAMP COLLECTORS!

Send 3c. stamp, and a promise to return in 10 days, and receive an A1 approval sheet of genuine stamps. Address, SCHIAFINO & CO., P. O. Box 74, Guadalajara, Mexico.

OPALS from Honduras. Specimens of this beautiful mineral, showing different shades of red and green, from 25 cents to \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

HALF of the money sent me for Montana minerals, will be used for postage on same. For instance send \$1.00 and receive 50 oz. post free.

A. G. KENNEDY.

Blatchford, Custer Co., Montana.

35 RARE CURIOSITIES, such as Perfumed Palestine Wonder Stone, Porcupine Quills, Minerals, Rare Foreign Stamps, Tin Tags, Sharks Teeth, Birds Wings, Odd Coins, etc., many of which are very old and rare, no 2 alike, for only 25c. Send at once before all gone. Satisfaction guaranteed.

CURIOSITY CO., Box 308, Kennedy, N. Y.



THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., JUNE, 1887.

NO. 8.

A TALK ON MINERALS.

By ARCHIE K. BATES.

PART I.

To the unpracticed eye, the costly gem, as it is found in the rocks, often appear worthless, and the most valuable ores appear to be simply rude bits of stone; for the metals are generally so hidden, that nothing of their real nature is seen. There is an ore of lead which has nearly the color and luster of the Glauber salt; an ore of iron which looks like sparry limestone; an ore of silver that might be taken for lead ore, and another that resembles wax. These are a few common cases, and consequently a most careful study and attention is required of the student or collector in order to make any progress in mineralogy. Moreover, a great proportion of mineral species are of no great value, and they occur under so many forms and manners that close study is absolutely necessary in order to be able to distinguish the useless, and avoid being deceived by them.

The Science of Mineralogy is, therefore, practical. Moreover, the very existence of many of the arts of the civilized world depends on the materials which the rocks afford. Besides the metals, we find the ingredients for many common pigments, and for various preparations used for medicinal purposes; also the enduring material so valuable for building purposes,

and numberless other uses. Moreover, from the rocks comes the soil upon which we are dependent for our food. At the same time, the student of mineralogy who is interested in observing the impress of infinite wisdom in nature around him, finds abundant pleasure in examining and collecting the forms and varieties which minerals assume, and in tracing out the principles of laws which Creative power has established, even throughout lifeless matter, giving it an organization which, though simple, is no less perfect than that of animate beings.

What is a mineral substance? It is said that mineralogy embraces every thing in nature that is lifeless. Is, then, every thing resulting from life a mineral? Are earths and clay and all stones minerals? Is water a mineral?

All the substances alluded to above belong to the mineral kingdom. The minute grains which make up a bank of clay or earth, are all minerals; and if their characters could be accurately ascertained, each might be referred to some mineral species.

It is evident, nevertheless, that the clay itself, unless the grains are all of one kind, is not a distinct species, though mineral in composition; it is a compound mass, or an aggregate of different mineral grains, which is true with all common soils or earth. Mineralogy points out the species and enables collectors to determine the ingredients in the constitution of such rocks. It searches for specimens that are pure and undisguised; ascertains their qualities and

their varieties, and thus prepares their mind to recognize them under any circumstances and in any form in which they may occur. A mineral, then, is any substance in Nature not organized by vitality, which has a homogeneous structure.

In pursuing the subject of minerals there is various qualities represented for our study. We observe that stones or minerals have color; they have hardness in different degrees, from being soft and impressable by the thumb, to the extreme hardness of a diamond; they have weight; they have luster, from almost a total absence of the power of reflecting light, to the brilliancy of a mirror. Some are as transparent as glass while others are opaque. A few have taste. These are the most obvious characteristics, and ones to which the mind would at once appeal in distinguishing species.

Other characteristics to which I will call your attention, and which are of equal value, are found in the internal and external structure of minerals. On examining a piece of coarse granite we find that each scale of mica may be split by the point of a knife into thinner leaves. These give evidence of a peculiar structure called cleavage, of which I will say more next time.

[TO BE CONTINUED.]

Sylvite.

By R. BRAUNS.

By observing the forms of figures which are produced on the cubic faces of sylvite, when it is exposed to the action of moist air, R. Brauns has succeeded in showing that the crystallization of this mineral is like that of cuprite and sal ammoniac, in the gyroidal hemihedral division of the isometric system. The bromide and iodide of potassium crystallizes similarly.

According to Prof. H. Schedtler, the electrical activity in the green, brown, and red crystals of tourmaline, are greater than it is in the black or colorless ones.

Harmotome, Phillipsite, and Stilbite.

By LANGEMANN.

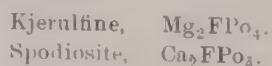
THE optical investigations of Langemann on harmotome, phillipsite, and stilbite, seem to indicate that these three minerals are triclinic in crystallization instead of monoclinic, as has heretofore been supposed.

According to this view the twining laws of these minerals are: (1) twining planes $\infty P \infty$ and OP, giving rise to interpenetrating fourlings with an orthorhombic symmetry; (2) two fourlings twined according to the plane $P \infty$ produces eightlings, with a quadratic symmetry; and finally (3), three eightlings with ∞P as their twining plane, yield twenty fourlings with a regular symmetry.

Place of Spodiosite in the Mineral System.

By A. STOGREN.

IN consequence of the chemical and crystallographic resemblance between spodiosite and kjerulfine, the author suggests that the two minerals may be isomorphous compounds, thus:



The planes of spodiosite, calculated from the axial ratio of kjerulfine would be ∞P , $\infty P \infty$, $-2P$, $+2P$, $4P \infty$.

Columbite from Colorado.

By W. P. HEADDEN.

A MINERAL hitherto regarded as tin ore from Turkey Creek, Jefferson Co., Colo., is found to be columbite rich in manganese. Sp. gr. 5.48. An analysis yielded: Nb_2O_5 77.83, $WO_3 + SnO_2$ 1.00, FeO 9.92, MnO 11.23, Total 99.98.

LAMELLAR THOMSONITE occurs in a small vein in the labradorite porphyrite at Be-shopton, Scotland.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART VIII.

TOMMY'S TIGHT PANTS--WE DESCEND INTO THE MINE.

ABOUT twelve persons attended the meeting besides our delegation. These seemed to be made up of all nationalities and each seemed to try to outdo the other in telling their experiences, so that it was more like a variety show than a prayer-meeting. We would have been all right had we not had a "laugher" amongst our number; that is, one of those persons who will laugh at almost nothing and set everybody else laughing. So when a German got up and told about "this vain and fleeting sh(oe)ow," he started laughing and soon had the rest of us doing the same thing. From then to the close of the meeting we were all in misery trying to keep from laughing. But when the leader asked us all to sing the Doxology, we heaved a sigh of relief.

But we only had time to heave one sigh as after the Doxology had been sung he announced an after-meeting and hoped that all would stay.

We looked anxiously at one another hoping somebody would start for the door and then we would have all done likewise. But nobody would start, so we were in for another half hour or so.

The first thing he said set us off. "Now all kneel." This does not seem a likely thing to set a person laughing, but when I tell you that one of our number, Tommy C., had on light-colored pants which were so tight in the knees that it was sure death to the pants to kneel down in them, you will know the reason why we were all set alauding.

Especially did we enjoy it as this was the very person who had been making us laugh all the evening. He turned red in the face and fumbled in his pocket for his handkerchief, while the sweat commenced coming out in beads on his forehead. He

grasped the front of the seat, put his handkerchief on the floor, and tried to kneel, but it was in vain; three times he made the attempt, but the pants would neither split nor stretch, so he slid back on his seat and moped the sweat off his brow.

All this time we thought we would kill ourselves laughing, and when he gave up the attempt there was a snicker all along the line. When the meeting was over we made ourselves scarce, fearing we would get a lecture on the way we conducted ourselves in church. This was our first and last visit to that church. Tommy never heard the last of those pants and he took the first opportunity to get rid of them.

The next morning we were delighted to find it a clear day and also quite cool. So after breakfast we prepared ourselves for another trip to Sterling Hill, not forgetting to take lanterns, candles, and matches, so as to be able to make a descent into the mine.

We started in time for the 8 o'clock train, as we did not care to walk down, having already examined the rocks between the two places.

Arriving at the Hill we went immediately to the spot where we had seen an opening in the ground with a ladder leading down into the darkness below. Lighting our lanterns we started down the ladder. After going down about fifty feet we came to a slanting slippery rock along which we cautiously walked about fifteen feet when we came to another opening and ladder, down which we went another fifty feet.

From here they had first taken out the ore rich enough to ship. Here the shaft gradually sloped downward, being ten feet high and twenty-five feet broad. The ore was now on all sides of us and we set to work examining the sides of the shaft for crystals. The first discovery was a crystal of Troostite about an inch in length. The second was a crystal of Franklinite. And so we continued until, when we were ready to ascend, our satchols were so heavy it felt as though somebody was pulling us back, and by the time we got to the surface we were pretty tired.

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year.....\$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch......50

Per Column.....2.75

Per Page.....5.00

Liberal discount on standing ads.

Nothing less than a half-inch ad. taken.

Advertisements must be in by the 20th, and exchanges by the 15th of the month to insure insertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

NEW YORK MINERALOGICAL CLUB.

THE eighth meeting of this Club was held at the house of Mr. J. B. Amend and was devoted to organization. The following officers were elected: George F. Kunz, Secretary; B. B. Chamberlin, Treasurer; D. S. Martin, Rev. J. Selden Spencer, E. A. Hutchins, and George F. Kunz, Executive Committee; R. P. Whitfield and L. P. Gratacap, Curators. After the reading and adoption of the Constitution and By-Laws, Mr. Spencer invited all the members of the Club to visit his home at Tarrytown on Decoration Day (where the next meeting is to be held), and to spend the day with him.

Mr. Kunz exhibited two fine nuggets of gold in quartz from California. Also a Topaz from Adun Tschiton, Siberia. Mr. E. A. Hutchins showed a very fine series of Corundums, in all forms, from North Carolina. Mr. John Rösch a fine orthoclase crystal, 5 inches long, from near Rye, New York. Also Laumontite from Tillie Foster Mine, Brewster, N. Y. Dr. Hunt an agate showing a curious condensation of light, owing to the great number of distinct layers acting on the light. Mr. H. T. Woodman presented two specimens of very minute garnet crystals in quartzite found in the city.

CONSTITUTION

AND

BY-LAWS

OF THE

N. Y. Mineralogical Club.

♦ ♦ ♦

CONSTITUTION.

ARTICLE I.

NAME.

The name of this organization shall be "The New York Mineralogical Club."

ARTICLE II.

OBJECTS.

The objects of this Club are:

1. To increase an interest in the science of mineralogy.
2. To collect, describe, and form into a permanent cabinet, the minerals of this island and vicinity; the same to be placed in some public museum, if possible fire-proof, in order to preserve a permanent record of localities which will soon be exhausted or destroyed.

ARTICLE III.

MEMBERSHIP.

Any resident of New York City or vicinity, interested in the pursuit of mineralogy, is eligible to membership in the Club. A candidate must be proposed and endorsed by two members, must be elected by ballot, and must not receive more than two negative votes.

ARTICLE IV.

DUES.

The dues of the Club shall be one dollar per annum.

ARTICLE V.

MEETINGS.

The meetings shall be held once every month, on the last Tuesday evening, if possible. They shall be held, as often as convenient, at the houses of members, who in turn are to exhibit their cabinets, thereby stimulating interest in the study, and awakening cordiality and fellowship among the members.

ARTICLE VI.

OFFICERS.

The Chairman of the meeting is to be, in all cases, the member at whose residence the Club shall meet. When a meeting is not held at a private house, a temporary chairman shall be elected by those present.

The Secretary is to be elected annually, to serve for one year.

The Treasurer is to be elected annually, to serve for one year.

Two Curators, who are to have charge of all the collections of the Club, shall be elected by ballot. These officers are to be, if possible, members who have no collections of minerals of their own.

An Executive Committee of three, who (with the addition of the Secretary) are to arrange for papers, material, places of meeting, and such other matters as may assist the general welfare of the Club, shall be annually elected by ballot, if requested by any member.

ARTICLE VII.

ALTERATIONS.

This Constitution may be amended at any meeting, by a two-third vote, provided notice has been given at a previous meeting.

BY-LAWS.

I

The order of business at the meetings shall be :

1. Reading of minutes.

2. New Business.

3. Presentation of new material, no member to occupy more than five minutes, unless by special request.

4. Presentation of any papers by members, or by others who have been invited to read them.

5. Examination of material brought in for exhibition.

6. Adjournment.

II.

Material or information presented to the Club is expected to be either entirely new, or of exceptional interest. Matter that has been presented and published elsewhere shall, as far as possible, be excluded.

All original matter will be brought before the New York Academy of Sciences, with a view to publication in the *Annals* or *Transactions* of that body ; and also in the hope that this Club may become, if possible, a permanent section of the Academy.

III.

Excursions, so far as may be, shall be arranged from time to time, to localities of particular interest, either in the vicinity, or at such places as the Club may be able to visit in part or as a body.

IV.

These By-Laws may be modified in the same manner as prescribed for the Constitution.

GEORGE F. KUNZ, Secretary.

B. B. CHAMBERLIN, Treasurer.

| | |
|-------------------------|------------------------|
| PROF. D. S. MARTIN, | } Executive Committee. |
| REV. J. SELDEN SPENCER, | |
| MR. E. A. HUTCHINS, | |

R. P. WHITFIELD, } Curators.

L. P. GRATACAP, }

❖ Archaeology ❖

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

THE STONE AGE IN NEW YORK.

By W. M. BEAUCHAMP.

THERE is one peculiarity in the Indian relics of New York that impresses the general collector at once, east, west, and south of central and western New York grooved axes are abundant. In the ancient territory of the Iroquois, they are scarcely ever found; perhaps never on village sites. I have examined a great many of their sites, some of which would be assigned to other nations, and the absence of this implement is everywhere conspicuous. It seems to be an Algonquin implement, never used by the Iroquois, or by their kindred.

This is a general feature of the sites from Albany to the Genesee River and probably to Lake Erie, and seems to prove that all the early inhabitants were of the same general stock. In other respects they varied much. Some used soapstone vessels, but not brown pottery. Other used brown pottery but not soapstone, the two never occurring together. Some had drills and scrapers in abundance; others lacked these entirely. I never have found them in enclosures. Other distinctions might be mentioned which serve for classification.

The frequency with which bird totines and stone tubes are found, is a matter of interest, but these and copper implements seldom appear on village sites. If used there they were seldom lost on the spot. The perforated gorgets are more frequent in such places, and are of a great variety of forms and material. On the distinctly Iroquois sites articles of bone and horn are oftener met with than on the earlier ones, where for some reason they are comparatively rare.

It is a curious fact that shell beads are not found here on pre-historic sites, showing that the early inhabitants had not reached the seashore, or conquered any of

its inhabitants. On the other hand the polished slate arrows, or rather arrow-shaped knives, are quite local in their use.

Other things might be mentioned to draw the distinct position that this region occupies in the archaeological field, as unique in many ways as the Iroquois nation were among the surrounding Algonquins. Here have been found the only barbed fish-hooks of bone or horn, and many other articles are as rare. It is fortunate that the field is now being thoroughly worked, with excellent results.

A Golden Nugget.

A COMFORTABLE LITTLE FORTUNE ALL IN ONE CHUNK.

THERE is at present on exhibition in Wells, Fargo & Co.'s bank at San Francisco a bit of auriferous rock that any individual might be glad to possess. It might be a little cumbersome as a "specimen" scarfpin, but when the wearer reflected that it was worth between \$6,000 and \$7,000, he might be braced up to making the extra exertion. The nugget is one of the finest ever unearthed in California, both in size and richness. It is irregular in shape, and about the size of an ordinary Derby hat. That there is very little rock and a great deal of gold in it may be determined by its weight, which is 35 pounds Troy. Quartz of this sort is usually valued at \$200 per pound, and, allowing the large margin of \$1,000 for rock, the nugget would be worth \$6,000. The exposed rock and great gobs of gold that hang out of its sides so as to nearly hide all other composition, and make it appear almost as melted metal, are not jagged or rough, but, on the contrary, are smooth and polished in a manner that only water is capable of. The proprietors of the nugget are Messrs. Hayes & Steeleman of Sierra City, and they have left it on exhibition for a few days before disposing of it. At the bank it attracts much attention, but the employes could furnish no information concerning it beyond that it came from Sierra County and near Sierra. —SAN FRANCISCO EXAMINER.

A VISIT TO THE PERKIOMEN COPPER MINES.

By ARON HAMBURGER.

A SHORT time ago it was decided to hire a pair of horses and a wagon and to pay a visit to the Perkiomen copper mines, at Shannonville, Pa., about twenty miles from North Wales. When the horses were ready we started, and in about two hours arrived at the village of Shannonville and asked directions in regard to getting to the mines. After receiving the necessary instructions we started for the mines, at which we arrived in ten minutes. We tied the horses to the now tumbled down and dilapidated mine buildings, and proceeded to hunt for specimens. The works were all in ruins and the main shaft choked up, but all around the mine were piles of ore four and five feet high. We found all around the place beautiful crystals of quartz and calcite, and the principal minerals found were:

Chalcopyrite, malachite, azurite, cuprite, galenite, zinc, brown, red, and white feldspars, and many quartz minerals. The chief ore of this mine is chalcopyrite of fair quality and richness.

Although the mines are in ruins ore is still shipped from these mines.

While we were busy examining the specimens an old man appeared on the place and threatened to have us arrested for trespass, etc. I could fill a page from the etc.'s which emanated from that man's lips. We asked him how much he wanted for the two hundred pounds or more of the ore we had loaded on the wagon, and feeling satisfied that fifty cents would soothe the sore, he asked that, and being paid became a warm friend of ours.

I forgot to say he was the manager of the property.

So when we spent a couple of hours examining the ore we started for home.

So ended our excursion to the mines.



ARTICLES of iron of unquestionable antiquity have been discovered among the remains of ancient Egyptian art.

Sarkinite, a New Manganese Arsenate.

By A. SJOGREN.

THIS mineral occurs in a vein of white calcite at Pajsberg in Sweden. It has a greasy luster, and is of a bright flesh-color. H. 4 to 5. Sp. gr. 4.14 to 4.15.

The mineral is brittle, giving a bright red powder. On heating, the powder first becomes grey, then black, and when strongly ignited a brownish black.

Crystalline system unknown. The mean of two analyses give the following figures:

As₂O₅ 41.60, P₂O₅ 0.21, Co₂ 0.76, MnO 51.60, FeO 0.13, CaO 1.40, MgO 0.098, PbO 0.25, H₂O 3.06. Insol. 0.38. Total 100.37.



Polyarsenite, a New Mineral.

By L. J. IJELSTROM.

THIS mineral was found at the Sjö mine, in the parish of Grylhytta, Orelro, Sweden. It is a hydrated manganese arsenate, of a reddish yellow color, translucent, massive, and without distinct cleavage or crystal planes.

It occurs with harmatostibiite (a manganese antimoniate) in calcite vein in a mass of tepherrite. Sp. gr. 4.085.

An analysis yielded: H₂O 3.15, Co₂ 3.51, As₂O₅ 39.23, Sb₂O₅ 1.37, MnO 49.88, FeO trace, CaO 2.85, MgO 0.77, total 100.76.

Formulae (MnO)₄ As₂O₅ + H₂O.



Aluminum Tin.

THE applications of aluminum are now considerable, and M. Bourbouze, a French physicist, has added to their number by employing an alloy of the metal with tin for the internal parts of optical instruments in place of brass. It consists of 10 parts of tin and 100 parts of aluminum. It is white, like aluminum, and has a density of 2.85, which is a little higher than that of pure aluminum. It is, therefore, comparatively light. It can be soldered as easily as brass, and it is even more unalterable than aluminum to reagents.

✧ Exchanges ✧

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

Good minerals for exchange. ELLA F. BOYD, Box 207, Hyde Park, Mass.

A good life for best offer of old U. S. or foreign coins. Address EXCHANGE, Box 5, Mt. Holly, N. J.

A printing press and outfit for the best offer of stamps in an album. A. K. BATES, Titusville, Penna.

I have fine bird eggs to exchange for minerals. Send list. PERSIE FARRROW, Parkersburg, W. Va.

Minerals, a pair of roller skates, etc., for a good lawn tennis racket. C. HADDAWAY, Easton, Maryland.

V-nickels without the word cent for best offer of minerals and Indian relics. JOHN C. GRAHAM, Willimantic, Conn.

Gold, silver, and nickel ore, and collection of tin tags for minerals. ARTHUR S. BARRETT, Box 351, Willimantic, Conn.

I have a fine lot of autographs to exchange for others. Also will exchange coins for autographs. H. T. UPSON, Parkersburg, W. Va.

I wish to exchange musical instruments, books, magazines, and minerals, for minerals not in my collection. N. W. STARBIRD, JR., Danvers, Mass.

I will exchange coins, Indian arrowheads and books, for U. S. coins, old books, crystals, Indian relics and autographs. J. L. M. WILLIS, Eliot, York Co., Me.

Arrowheads and other Indian relics for minerals, fossils, curios of all kinds and other Indian relics not in my collection. Send list. J. H. DOWNIE, Romeo, Mich.

Wanted, a steel-spoked rubber-tired bicycle and other things, in exchange for stamps, coins, Indian relics, etc. R. T. JAMES, Vernon Hill, Halifax Co., Va.

A collection of 25 var. (50 spec.) Mazon Creek fossils (feras, flags, insects, cones, seed-pods), I will exchange for gun, press, or other offers. J. G. WAINWRIGHT, Waukegan, Ill.

I have a fine Indian corn pounder to exchange for the fowling U. S. cent, fillet head, and 1857, small date. Dealers in coins send list. WILL T. MILLER, Box 45, Parkersburg, W. Va.

Colophonite, pistacite, ripidolite, magnetite, etc., for fine minerals. Cinnabar and crystals of all kinds especially desired. List on application. EZRA R. LARNED, 50 24th St., Chicago, Ill.

One of James' famous mud-stones for a stamp collection or a pair of opera-glasses. C. HADDAWAY, Easton, Md.

I will exchange a lot on Allen St., Jamaica, cost \$200, for an upright piano in good condition. MRS. SCHERR, 441 Hudson Street, New York City.

I would like to exchange minerals and fossils for Cretaceous fossils. Send list and I will do the same. J. J. ALTON, 3 Christy St., Worcester, Mass.

Two arrowheads or a 2x2 in. spec. of either pink granite, green feldspar, iron ore, a geode, or fossil coral, for every V-nickel without cents sent me. L. H. HENRY, Bonaparte, Iowa.

I have a polygraph and some old papers in mourning for Grant and Garfield to exchange for coins, relics, or curiosities. Send for list of old papers. OSCAR M. HEISS, 956 Shackamaxon St., Phila., Pa.

I will give a watch and chain, a pair of opera glasses, five volumes of Youths' Companion, three volumes Golden Days, a jig saw and some books, for a canvas canoe. FRED. R. DIX, 375 Tremont St., Boston, Mass.

U. S. revenue, document, match, medicine, proprietary, playing card, and U. S. and foreign postage stamps to exchange. Philatelic papers to exchange for others or for stamps. B. G. A., Box 67, Brooklyn, N. Y.

Will exchange a new guitar for an E-flat or B-flat cornet, or job printing. Those wanting to ex. job printing, send prices per 1000 for 6x8 circulars printed on both sides. L. M. EDWARDS, Box 170, Knightstown, Ind.

Four books on natural history, coins, medals, writing pens, etc., for the best offer of a printing press and outfit (self-inker preferred), or offers. No postals answered. WM JOS. BUCKLEY, 125 Greenwich St., New York City.

Any person having any of the following papers to sell or exchange please write to me. Philatelic Monthly, Vol. IX, Nos. 1, 2, 3, 4, 6, 7, 8, 10, 11. Vol. X, Nos. 1, 3, 5, 8, 9, 11. Vol. XI, Nos. 3, 5, 7, 8, 11. Vol. XII, Nos. 3, 5, 10, 11. ULYSSES CLARK, Pipestone, Minn.

Tin tags, paper headings, and postmarks to exchange. I will give 5 different rare tags for every foreign, revenue, department, war, treasury, or old U. S. stamps not in my collection. Send stamps on sheets that I may select therefrom. EXCHANGE, Department C, Box 5, Mt. Holly, N. J.

I have a few of the rare 10c. unpaid letter, Belgium, cut in half and doing duty as 5c. on original letter. Will guarantee them genuine. Will exchange them for medals or stamps for my collection to value of 75c. Collection consists of 5000 var. Send sheets for selection to W. P. YOUNG, Pond St., Jamaica Plains, Mass.

REASONS WHY THE EXCHANGERS' MONTHLY IS A GOOD ADVERTISING MEDIUM.

The EXCHANGERS' MONTHLY has now (April, 1887) been published for a year and a half, so that it is no untried experiment but an assured success. Its record during this time has been such as to build up for it a firm foundation. Never behind time in publication. No skipping a month and making so-called double numbers. Always improving without additional cost to its subscribers. Its low subscription rate (25 cts. a year). Its neat, clean appearance and freedom from typographical errors. Its illustrated articles. Its able editing. The freedom of its columns from trashy matter, book notices, recommendations, and other matter which is of interest to no one. These are some of the reasons which has made one and all of its subscribers friends and has gained for it a name which is unequalled by any other amateur publication. Its subscription list has grown to an immense size, considering the short time it has been published, and there is every reason to believe it will continue to grow at the same rapid rate. Another reason for its success is its exchange columns, which are free to all. As Harpers' "Young People" continued to cut down the space allowed for exchange notices, exchangers have been forced to seek other publications in which to insert their notices, and we have received a fair share of these as subscribers to our MONTHLY. Now these very exchangers make the best of buyers, as it is a well-known fact that to secure anything really good, you must buy it, and that exchanging is only good to lay a foundation for our cabinets. Now the question naturally arises: As the EXCHANGERS' MONTHLY is devoted principally to Mineralogy, is there any good in my advertising Postage Stamps, Bird Eggs, Curiosities, etc., in its columns? The best answer to this is the fact that there has never been a number published without an ad. of Postage Stamps for sale in its columns. The reason of this is that the MONTHLY is not sent to subscribers only, but hundreds are sent to collectors of all kinds and to different ones every month. But after all the best way to convince yourself that our MONTHLY is a good advertising medium is to write to some of our advertisers and ask them if their advertisement pays them. We give below a table of rates which we think will compare favorably with that of any other monthly of our standing.

ADVERTISING RATES, 1 to 12 insertions.

| | 1 | 2 | 3 | 4 | 8 | 12 |
|---------------------|--------|--------|--------|--------|--------|--------|
| $\frac{1}{2}$ inch, | \$0.25 | \$0.40 | \$0.50 | \$0.60 | \$1.00 | \$1.40 |
| Inch, | .50 | .80 | 1.00 | 1.20 | 2.00 | 2.80 |
| $\frac{1}{4}$ page, | 1.50 | 2.25 | 2.85 | 3.25 | 4.75 | 6.00 |
| $\frac{1}{2}$ page, | 2.75 | 4.25 | 5.25 | 6.25 | 9.50 | 12.50 |
| Page, | 5.00 | 8.00 | 10.50 | 12.50 | 18.00 | 23.00 |

THOS. CHAMBERLAIN, JR.,

— PUBLISHER —

284 PAVONIA AVE. - - - - JERSEY CITY, N. J.

RUBBER STAMPS.

**Your Name and Address on a
Nickle-Plated Pocket or Pencil Stamp with Ink.
Only 40c.**

AGENTS WANTED.

R. W. FORD, Rubber Stamp Mfr., Bristol, Conn.

THE ARIZONA MINERAL COLLECTION.

PUT UP BY

MR WILLIAM NIVEN,

Late Assistant-Commissioner, Arizona Territory,
World's Fair, New Orleans.

ONLY 50 CENTS A BOX.

This is the most attractive collection that has yet been put in the market, and should meet with a large sale. It consists of 12 specimens packed in cotton in a partitioned box each accompanied by a printed list giving name of mineral, composition, etc., together with an engraving of the Natural Bridge, Chalcedony Park, Arizona Territory, which is made entirely of the wood of which this collection contains a piece. Each box contains:

FLUORITE.

FREE GOLD.

CHALCOITE.

MALACHITE.

CHALCOPYRITE.

SMOKY QUARTZ.

NATIVE COPPER.

JASPERIZED WOOD.

AZURITE CRYSTALS.

CUPRITE ON LIMONITE.

ARGENTIFEROUS GALENA.

ARGENTIFEROUS QUARTZ

For sale by

A. CHAMBERLAIN.

284 Pavonia Ave., Jersey City, N. J.

THE

OOLOGISTS' COMPANION

Is a large 8-page monthly paper devoted to the interest of Oologists and Ornithologists.

15 cents per year.

Sample copy free.

ADVERTISING RATES LOW.

GEO. M. ELLISON,

16 SUMNER ST., LYNN, MASS.

MASON CREEK FOSSILS.

Having about 200 of these celebrated Fossils which I wish to clear out, I am offering them at 15 c. each, 8 for \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

RARE MINERALS FOR SALE AT LOW PRICES.

| | |
|--------------------------------------|---------------|
| Sillimanite, | .25 to \$2.00 |
| Ripidolite (variety rare), | .25 to 1.00 |
| ChalcOPYrite, | .10 to 1.00 |
| Tremolite, | .10 to .50* |
| Albite xls., | .10 to .75 |
| Green Curled Hornblende, | .10 to 1.00 |
| Kyanite (blue and yellow), | .10 to .50 |
| Magnetite (fine), | .10 to .50 |
| Enstatite, | .05 to .50 |

Send stamp for complete list. Satisfaction guaranteed. Discount on quantities.

EDWARD DAVID & CO.,

Lock Box 28, Willimantic, Conn.

PRICE LIST OF JOB PRINTING

Delivered FREE of Charge!

| | PRICE FOR 100, | 250, | 500, | 1000 |
|---|----------------|------|------|------|
| Note Heads, size $5\frac{1}{2} \times 8\frac{1}{2}$, | .35 | .80 | 1.50 | 2.50 |
| Letter Heads, size $8 \times 10\frac{1}{2}$, | .50 | 1.10 | 2.00 | 3.75 |
| Envelopes, size 5, | .30 | .75 | 1.00 | 2.00 |
| Envelopes, size 6, business size, | .35 | .80 | 1.50 | 2.50 |
| Business Cards, | .35 | .75 | 1.25 | 2.00 |
| Statements, size $5\frac{1}{2} \times 8\frac{1}{2}$, | .35 | .80 | 1.50 | 2.50 |
| Bill Heads, 6-lines, | .40 | .80 | 1.50 | 2.50 |
| Bill Heads, 14-lines, | .50 | 1.10 | 2.25 | 4.25 |
| Shipping Tags, | .35 | .75 | 1.25 | 2.00 |
| Circulars, 4×6 , | .75 | 1.00 | 1.50 | |

We use the best quality of paper and do the best of work.

 All Printing delivered to any part of the U. S. FREE of Charge.

We make a specialty of Job Printing for Naturalists and Collectors, Papers or Magazines, Circulars, Price Lists, Labels, Data Blanks, etc.

Every description of Job and Commercial Printing neatly done at the Lowest Prices. Send for estimates on any printing you may need.

Our paper **The Exchangers' Monthly**, 25 cts. a year.

THOS. CHAMBERLAIN, Jr.,

284 PAVONIA AVE.,
JERSEY CITY, N. J.

VOL. II.

NO. 9.

JULY, 1887.

Price, 3 cents.

THE

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| A TALK ON MINERALS, - - - - - | 65 |
| APOPHYLLITE, - - - - - | 66 |
| HOW MINERALS CHANGE COLOR, - - - - - | 66 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - - - - | 67 |
| OCCURRENCE OF SILVER IN VOLCANIC ASH, - - - - - | 68 |
| PLATTNERITE, - - - - - | 68 |
| GOLD FOUND ON THE ALASKAN FRONTIER, - - - - - | 68 |
| EXCHANGES, - - - - - | 69 |
| BURIAL MOUNDS OF MANITOBA, CANADA, - - - - - | 70 |
| SILVER IN A MOUND, - - - - - | 70 |
| BROOKLYN AS A LOCALITY, - - - - - | 71 |
| TO MINE IRON ORE IN NEW JERSEY, - - - - - | 71 |
| NEW YORK MINERALOGICAL CLUB, - - - - - | 72 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.

MONEY

made easy Manufacturing Rubber Stamps. Send for Price List of Outfits. to J. F. W. Dorman, No. 217 East German Street, Baltimore, Maryland, U. S. A.

TACOLUMITE, or Flexible Sandstone. Specimens of this strange and interesting mineral from 15 to 50 cts. **ARTHUR CHAMBERLAIN**, 284 Pavonia Ave., Jersey City, N. J.

STAMP COLLECTORS!

Send 3 c. stamp, and a promise to return in 10 days, and receive an A 1 approval sheet of genuine stamps. Address. **SCHIAFINO & CO.**, P. O. Box 74, Guadalajara, Mexico.

OPALS from Honduras. Specimens of this beautiful mineral, showing different shades of red and green, from 25 cents to \$1. **A. CHAMBERLAIN**, 284 Pavonia Ave., Jersey City, N. J.

A SAMPLE SELF-INKING STAMP which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc., all mailed free for 50 cts. (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

THE ARIZONA MINERAL COLLECTION.

PUT UP BY

MR. WILLIAM NIVEN,

Late Assistant-Commissioner, Arizona Territory, World's Fair, New Orleans.

ONLY 50 CENTS A BOX.

This is the most attractive collection that has yet been put in the market, and should meet with a large sale. It consists of 12 specimens packed in cotton in a partitioned box each accompanied by a printed list giving name of mineral, composition, etc., together with an engraving of the Natural Bridge, Chalcedony Park, Arizona Territory, which is made entirely of the wood of which this collection contains a piece. Each box contains:

FLUORITE,

FREE GOLD,

CHALCOCITE.

MALACHITE,

CHALCOPYRITE.

SMOKY QUARTZ,

NATIVE COPPER.

JASPERIZED WOOD,

AZURITE CRYSTALS.

CYPRITE ON LIMONITE.

ARGENTIFEROUS GALENA,

ARGENTIFEROUS QUARTZ.

For sale by

A. CHAMBERLAIN,

284 Pavonia Ave.,

Jersey City, N. J.

MINERALOGISTS, GEOLOGISTS, ARCHÆOLOGISTS, AND ALL COLLECTORS OF NATURAL HISTORY SPECIMENS.

The label herewith illustrated is very neat and useful, it being printed on tinted card board.

PRICES.

100, 25c.; 500, 75c.; 1000, \$1.25.

Send money by postal note, one or two-cent stamps, or small amounts in silver (wrap the silver in paper). Address,

THE CHAMBERLAIN PRINTING CO.,
284 PAVONIA AVE., - - - JERSEY CITY, N. J.

| | |
|----------|-------|
| No | |
| Name | |
| REMARKS | |
| LOCALITY | |

THE EXCHANGER'S MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., JULY, 1887.

NO. 9.

A TALK ON MINERALS.

By ARCHIE K. BATES.

PART II.

I SPOKE about Cleavage, in Part I, as a notable characteristic about minerals, for where mica is found, this peculiarity is constant. The feldspar in the same rock, if examined with care, will be found to break in certain directions with a smooth, or nearly smooth surface, showing a luster approaching that of glass, though somewhat pearly. It is true of feldspar, also, that the cleavage is a constant characteristic for the species, as regards direction and facility. In nearly all minerals, this kind of structure, more or less perfect, may be distinguished. In a broken bar of iron the irregularity of the grains proceeds from this cause. In granular marble the several grains, if attentively examined, will be seen to present a distinct cleavage structure, and consequent angular forms, although the mass as a whole has no such structure. In finer varieties, the grains may be so small that the cleavage cannot be observed: or, again, the texture of the mass may be so compact that not even grains can be distinguished.

This Cleavage, then, is a peculiarity of internal structure. It is intimately connected with another fact: that these same minerals often occur under the form of some regular solid, with neat, plane surfaces, and are finished with a symmetry

and perfection which art would fail to imitate. These forms are their natural forms, and every mineral has its own distinct system of forms. The beauty of cabinet minerals arises to a great extent from the variety of forms and high finish of these gems of Nature's handiwork. The mineral quartz sometimes occurs in crystals consisting of two pyramids united by a short six-sided prism, and they have generally the transparency and almost the brilliancy of a diamond, whose name they bear in common language. The "diamonds" of Central New York and of many other places are of this kind.

In other cases a large surface of rock sparkles with a splendid grouping of the pyramidal glassy crystals. We might draw other illustrations from almost all the mineral species, but this will suffice to show that, in addition to the physical characteristics above mentioned, there are others which depend on structure, which afford the distinction of species apparent, both in external form and internal cleavage.

It is perceived, therefore, that the learner may (1) examine into the peculiarities of structure among minerals; (2) he may attend to the physical characters depending upon light, hardness, and gravity; (3) he may acquaint himself with the effects of heat and chemical re-agents—the chemical characteristics. These are three sources of distinction giving mutual aid, and a knowledge of all is necessary to the mineralogist.

To learn to distinguish minerals by their color, weight and luster, is so far very well; but the accomplishment is of a low degree of merit, and when most perfect makes but a poor mineralogist. But when the science is viewed in the light of Chemistry and Crystallography, it becomes a branch of knowledge perfect in itself, and surprisingly beautiful in its exhibitions of truth. We are no longer dealing with pebbles of pretty shapes and tints, but with objects modeled by a Divine hand: and every additional fact becomes to the mind a new revelation of His wisdom.

In the study of mineralogy the collector should first study and determine the structure of minerals. We will treat of this subject under its usual name, viz, Crystallography.

[TO BE CONTINUED.]

APOPHYLLITE.

This species crystallizes in forms belonging to the tetragonal system, but according to the views of Profs. Mallard and Rumpf. it is pseudo-tetragonal, or the monoclinic of Dana. They base their conclusion on the so-called "optical anomalies," and the theory has been accepted by many prominent crystallographers and mineralogists, both in America and Europe.

The crystals sometimes assumes nearly a cylindrical or barrel shape. The only twinning-plane is the octahedron. The cleavage is highly perfect, parallel to the basal plane. Hardness 4.5 to 5. The luster is pearly upon the cleavage plane, otherwise vitreous. Color generally white, occasionally green, yellowish, rose-red to pinkish. Transparent, rarely opaque, and is brittle. In composition it is a hydrous silicate of lime and potash, with a small portion of the oxygen replaced by fluorine. According to Rammelsberg, the ratio is 9:32:16; he writes the formula



The varieties are: 1st. Ordinary.--Usually in crystals which are remarkable for

their pearly basal cleavage, which is nearly cubic. 2d. Oxhaverite is in pale green crystals, found in petrified wood at the Oxhaver Springs, near Husavick, in Iceland. 3d. Hylocholore, from Sicily, is an olive green and has a Sp. Gr. of 2.2904. These varieties owe their color to the presence of iron. 4th. Albin.—The original came from Aussig, in Bohemia, was small, nearly cubical, and opaque. This variety also occurs at Fitz Island, Berks Co., Pa. 5th. Tesselite, from the Farø Islands, is a cubical variety exhibiting a tessellated structure in polarized light. 6th. Leucocyclite, when plates parallel to the base are examined by means of polarized light, show a black cross with rings that are alternately white and violet black, with compensation positive, instead of the ordinary colored rings a peculiarity observed in crystals from the Seisser Alps, Andreasberg. Some crystals similarly examined by Des Cloizeaux, from Uto and Cziklowa, exhibited a black cross on a deep violet ground, with compensation negative. These different optical phenomena may be presented by contiguous plates of the same crystal.

[TO BE CONTINUED.]

How Minerals Change Color.

It may not be generally known that many minerals lose their color or fade when exposed to light. Experienced collectors frequently keep their most finely colored specimens in a dark place.

Fluorite is especially liable to fade. Amazon stone, however, sometimes gains in color when exposed to light.

A greenish-gray feldspar from the granite veins of Ammersberg has been found to assume a bright emerald green when exposed to the air.

Experiments made by placing fragments in sealed tubes and exposing them to the light for a year, led to the conclusion that air and moisture had no influence, but that light alone effected the change in color.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART IX.

WE MISS THE TRAIN—A LAST VISIT TO MINE HILL AND A RIDE THROUGH HAMBURGH—BYRON AND THE HORNET.

AFTER leaving the mine we struck across lots for the depot as fast as our tired legs would permit, as it was already getting dark and if we missed that train we would have to walk, which none of us felt like doing.

Just as we got within five hundred feet of the depot we saw the train pull in. We all set out on a run, yelling like wild Indians, but I think the conductor owed us a grudge, or else took us for tramps, as when we got within a hundred feet of the station the train started off.

Paul's race with the bull had increased his running capacities to such an extent that he was able to outstrip us and get there in time to sling on the last step, where he stood laughing at us, while we set down on the platform and looked woefully at the fast receding train.

However there was nothing to be done but foot it, so we started off. Railroad tracks when in good condition are hard places to walk on, and this I believe is one of the worst constructed roads in this country. It seemed as though we would never reach Franklin.

When we did reach the house and saw Paul lazily lying in the hammock reading a paper, we felt like dumping him out, and when he said: "Well boys, how did you enjoy your walk?" he had to again exhibit his running capacities to get out of our reach.

We got all over our walk by the next morning and were ready for another trip. It was Saturday and our last day of collecting, and we decided to spend it by a visit to Mine Hill and a trip up to and through Hamburg. In order to cover as much country as we could, we took the ex-

press wagon along, fixing in some pine boards so as to have seats for all. But it was fun when the wheel struck a rock to see one of the boards slip off the edge and dump the three who happened to be sitting on it in the bottom of the wagon.

We started about 7 o'clock and rode to the depot, where we left the wagon and ascended Mine Hill, where we paid a visit to the Superintendent and took a last look at the mine. We then made a circuit of the hill, finding on our way some very good Jeffersonite crystals.

From there we went back to the wagon and started for Hamburg. A short way from the village we came across a place where they were blasting and got some very interesting specimens of Phlogopite, some of them an exact reproduction of the one given in Dana's Text-Book.

From here we went to what is known as the Tourmaline locality, about a mile north of Hamburg, and got some pretty good black Tourmalines, one of our number being lucky enough to find a crystal of blue corundum.

Striking a road that ran east, we came across some small but pretty garnets of the almandine variety.

We were now pretty hungry so we drove to some woods not far off, and in which there was any amount of blackberry bushes, and ate our lunch, finishing up with blackberries. As it was now pretty hot we decided to stop in the woods until the heat abated a little, and then drive out further into the country. So some of our number laid down and either read or took a nap, while the rest took a walk through the woods to hunt for anything that would interest them.

One of our number, Byron B., was never satisfied unless he was meddling with something he hadn't ought to. We had not gone far when we came to a hornet's nest in a hollow tree. He got a long pole to give it a knock, although cautioned by us to leave it alone. We got a safe distance from the nest to watch the fun. Creeping cautiously up he gave the nest a good poke.

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year.....\$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch......50

Per Column.....2.75

Per Page.....5.00

Liberal discount on standing ads.
Nothing less than a half-inch ad. taken.
Advertisements must be in by the 20th, and
exchanges by the 15th of the month to insure in-
sertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

Now that collecting trips are under full sway, we would like to have some of our subscribers send us descriptions of their trips, also the names of localities where it would pay to make a trip. There are so many localities which have been at one time good places to visit, but which are now either exhausted or built over, that a collector often makes a useless trip. Let each subscriber give the names of the localities he knows personally of, together with what minerals can be collected there with little trouble.

Occurrence of Silver in Volcanic Ash.

FROM THE ERUPTION OF COTOPAXI, JULY
22D 23D, 1885.

By J. W. MALLET.

THE sample was collected at Bahia de Caraquez, where the ash had fallen to the depth of several inches, although the place is 120 miles to the westward of Cotopaxi. The specimen consisted of a very fine mobile powder, soft to the touch and of a light brownish-gray color. Under the microscope it appeared to consist of minute more or less sharp or splintery edged granules and specules, quartz, a white and

pink or reddish feldspar, augite, magnetite (strongly magnetic), and thin scales of deep red specular iron oxide, were easily distinguished. When strongly heated, the ash turned dark reddish brown, and fused nearly to a black slag. Sp. Gr. = 2.624 at 18 degrees; 0.21 per cent. of the ash was soluble in boiling water, and 6.94 per cent. was dissolved in HCl from the portion insoluble in water. The ash dried at 100 degrees, contained: SiO_2 56.89, Al_2O_3 19.72, FeO 3.65, MgO 1.91, CaO 5.87, Na_2O 5.14, K_2O 1.96, H_2O 0.62, with traces of TiO_2 , MnO , Li_2O , Ag , Cl , SO_3 , P_2O_5 . The silver present amounted to about 1 part in 83600 of ash; but although the proportion is so small, the total amount ejected during the eruption would be considerable when the vastness of the mass of volcanic ash is taken into consideration. The silver was probably present as a chloride. This is the first time silver has been found in volcanic ash.

Plattnerite.

By E. KINCH.

A MINERAL from Leadhills, Lenarkshire, analyzed by the author, proved to be Plattnerite, a mineral not examined since it was first noticed by Breithaupt and Plattner, in 1837. An analysis yielded: Loss on ignition 7.10 + PbO 92.66 = Total 99.76.

Gold Found on the Alaskan Frontier.

WORD comes from Ottawa, Canada, of the discovery of rich gold deposits in British Columbia close to the imaginary boundary line between that province and Alaska, which may lead to serious trouble if the actual boundary is not defined before any attempt is made to develop these valuable finds. In view of the discovery of gold in the Pacific provinces, the Dominion Government have decided on sending out a party to make a geological survey of that part of the country. An appropriation has been asked in order to fix the boundary line.

✧ Exchanges ✧

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

Fifty varieties of minerals to exchange for minerals, fossils, and Indian relics. A. E. HAMMOND, Willimantic, Conn.

Minerals in exchange for the same. New York County and Bergen Hill minerals wanted. J. E. UNDERHILL, 144 South Elliott Place, Brooklyn, N. Y.

Will exchange autograph signatures, all kinds of Indian relics, old U. S. coins, etc., for U. S. and foreign stamps. H. T. UPSON, Parkersburg, W. Va.

I will give over 25 tin-tags for every two arrowheads sent me (located), or one spearhead. OSCAR M. HEISS, 956 Shackamaxon Street, Philadelphia, Pa.

Franklinite, willemite, and zincite, also Mexican onyx, for minerals not in my collection. Send lists. E. G. MATHIAS, 294 Pavonia Ave, Jersey City, N. J.

Old Indian relics for old U. S. cents and coins of old dates of any consequence which may be obtained, for Indian relics MAURICERANCH, Parkersburg, W. Va.

U. S. revenue, document, match, medicine, proprietary, playing card, and foreign postage stamps, to exchange for others, or for stamps. B. G. A., P. O. Box 67, Brooklyn, N. Y.

I have \$8.00 worth of silver polish and fluid ink-eraser, which I wish to exchange for printing-press about 3½ x 5, or good revolver. Offers invited. A. A. Buzzard, Austin, Oakland Co., Cal.

Geology and Mineralogy. - Correspondence desired for mutual profit. Exchange specially minerals of Gwynedd and other Penna. localities. ARON HAMBURGER, Box 1, North Wales, Penna.

U. S. revenue stamps to exchange for arrowheads, medals, coins, fractional currency, or rare postage stamps. Write me what you have and what is wanted for same. W. P. YOUNG, 61 Vale St., Roxbury, Mass.

Will exchange a bicycle, ten Indian axes, Indian and Moundbuilders' relics, fossils, minerals, sea curiosities, silver watch, Fobert rifle stamps, postmarks, and taxa, for rare curiosities, U. S. department, revenue, and old postage stamps, or anything else. F. N. MASSOTH, Jr., Hanover Center, Ind.

Fine minerals to exchange for the same. Send lists. W. A. ARNOLD, Lock Box 4, Willimantic, Conn.

Two cakes of Frozen Perfume for every V-nickel without cents. MASON & CO., 82 Beekman St., New York City.

Good minerals to exchange for the same. Send list and I will do likewise. JAMES P. BATH, Box 517, Willimantic, Conn.

A Ruby Magic Lantern and full outfit, also six months of Golden Days, for offers. B. L. PORTER, Box 31, Owensdale, Pa.

Curiosities of all kinds, stamps, Indian relics, and coins, to exchange with other collectors. G. W. PITMAN, Newcastle, Indiana.

A foot-power scroll saw, with lathe attachment, one pair roller skates, cost \$1.50, and several books for best offers of anything. J. L. NEAL, Skipton, Md.

I have 123 rare tobacco tags to exchange for large U. S. cents and foreign coins. PERCY D. FARRELL, Box 453, Parkersburg, Wood Co., W. Va.

Beryl, soapstone, and flint, for any kind of ore, crystal coral, petrification, mineral, fossil, or relic. G. ROBERTS, Box 251, New Brighton, Staten Island, N. Y.

Iron ore, petrified clams, gypsum, fossils, etc., for a good magic lantern, with slides. LILLIE HUNTER, corner of Jefferson and Franklin Sts., Sandusky, Ohio.

Will exchange a fine breeding pen of Wyandottes for a good breechloading shot-gun, 11 bore. Must be in good condition. State what you have. W. A. JONES, Xenia, Ohio.

Very fine specimens of azurite, malachite, and wulfenite from Arizona; turgite, garnets, and Pyrophyllite from this State, returned in exchange for Indian spearheads or other relics. GEO. W. HOBSON, 4555 Wakefield St., Germantown, Pa.

Will exchange story books, Scientific Americans, and other papers for books of shorthand, music for guitar, book-form or otherwise, or complete popular songs. Give full description in writing. Send offers. H. G. HOUGHON, 702 S. 4th St., La Crosse, Wis.

I will exchange for minerals not in my collection the following half-pennies: 1828, 1835, 1851, 1855; copper one-cents, 1812, '14, '17, '22, '26, '27, '28, '29, '37, '38, '43, '46, '49, '50, '52, '56, in good condition. Address WILLIAM BICKY, 5561 Germantown Ave., Phila., Pa.

I will give fine arrowheads and spearheads for any or all of the fowling U. S. cents, 1795, thick planchet, or 1817 with 15 stars, 1828 small date, and 1857 small date, or will give arrowheads for U. S. and foreign stamps. W. T. MILLER, P. O. Box 45, Parkersburg, W. Va.

❖ Archæology ❖

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

BURIAL MOUNDS OF MANITOBA, CANADA.

By Prof. CHAS. N. BELL.

SEARCH has recently been made for the remains of the Mound-Builders in the Province of Manitoba, Canada. This Province is situated directly north of Minnesota and Dakota. Investigation has revealed the presence of several groups of burial mounds on the banks of the Red, Assiniboine, Pembina, and Souris rivers. Several of these mounds have been opened, and the articles found in them include human and animal bones, stone scrapers, tubes, pipes, and mauls, bone needles and fish spears, copper chisels, awls and ornaments, gorgets, beads, and other ornaments cut from marine shells, pottery, etc., which are identical in character with those catalogued in the National Museum of the United States, as recovered from the mounds of the Mississippi and Ohio valleys. The structure of the mounds already opened is the same as the ordinary burial description, though in one case there appeared to be an altar. There is a line of mounds from St. Paul, Minnesota, on the Mississippi River, up the Minnesota River, and down the Red River to Lake Winnipeg.

Living at Lake Winnipeg, the Mound-Builders must have known of the Nelson River emptying into the tide water of Hudson Bay, and of the great Saskatchewan with its feeders interlocking with those of the Mackenzie, flowing into the Arctic Ocean near Alaska. Pottery has been found on both the Nelson and Mackenzie, while none of the Indians living on those streams manufactured it when the whites first came in contact with them.

A careful comparison made between the mound form of burial and the scaffold and other forms practiced by the Indians of the Canadian Northwest, as described by the

French and English fur traders and adventurers who first entered the country, shows no similarity. The tribes have no traditions regarding these mounds, except in a few instances, and these have proved absurd and without foundation. On the Rainy River, east of Manitoba, there is a mound of great size, measuring forty-five feet in height and several hundred in circumference.

SILVER IN A MOUND.

RECENTLY a number of persons south of Oaklands, Ill., near the Ambran river, determined to open a number of mounds which have been standing on a hill overlooking the river. In all, the cluster of mounds number fourteen, some larger than others.

The first six mounds opened contained only a few stone axes and handles of the same material, bones, etc. It was decided to open the largest mound. Work progressed slowly until the pick-axes of the party hit a hard substance. In three other places the dirt was removed when the discovery was made that a stone wall ten feet square barred the use of the picks. The dirt was all excavated from the walls and an entrance found on the top.

Further investigation brought to light five or six skeletons. Three copper vessels were also found and these filled with crude pieces of silver ore, which when scraped, shone brilliantly. The silver weighed over fifty pounds, and varied in length from one to four inches, the most of it being round, in lumps. A copper axe weighing eighteen pounds, attached to a stone handle, and a number of tomahawks of the same material, were also found.—THE AGASSIZ COMPANION.

SOME of the mound-builders' best production of art are their pipes. In many of these they have shown remarkable skill. Birds, such as eagles, turkeys and smaller birds, otters, foxes, frogs, etc., as well as the human face are represented in the make of a great number of pipes.

BROOKLYN AS A LOCALITY.

By JAS. E. UNDERHILL.

To many, the heading of this article will seem absurd, but it is a fact, that with but one or two exceptions, the Long Island boulder drift, presents a better field to the geologist, than any other drift this side of the Mississippi. I will speak only of the western portion of the Island. The best locality is that immediately east and west of the park.

Here, boulders may be found varying in size from a small pebble to rocks of huge dimensions, showing visibly on their exterior, the action and rounding power of water.

These were deposited during the aluvium or drift period, and, although most of them are covered with soil, a large portion remain above ground. Below is a list of the more numerous specimens found here.

Anthophyllite in boulders consisting of radiating, fibrous crystals of a grayish color. One variety resembles asbestos very closely.

Calcite occurs as limestone of a gray color. I came across one piece which, on breaking open, I found to be full of fossil shells of two varieties, the largest measuring two inches across, was probably a species of Brachiopod known as *orthis retrosistria*. The smaller ones resembled the spirifer.

Dendrite; my attention was called to a very fine specimen of this mineral from a lot in the central portion of the city.

Garnets are found of a light red color in orthoclase, mica schist, and gneiss. They are sometimes met with, measuring as much as $\frac{3}{4}$ of an inch in diameter. I sifted nearly half a pint of a dingy red color and as large as peas, from a mica schist which had crumbled to dust, thus leaving the garnets free from the matrix.

Hornblende occurs in small black and green crystals penetrating the matrix.

Muscovite occurs in orthoclase, of a black, gray, and green color, in plates measuring from an eighth of an inch to three inches broad and as many thick. Occurs also in mica schist and gneiss.

Orthoclase occurs in large boulders, scattered promiscuously over the Island, of

a milk-white, flesh-red, and light gray colors. It breaks easily into perfect rhombs, and often contains mica. I have one piece containing a cavity filled with curious rounded crystals of a glazed appearance.

Quartz occurs in boulders and in the form known as "hard head." Many varieties are found here. Milky, of a milk-white color, often translucent, but more commonly opaque. Smoky, in small pieces from four to twelve inches in diameter, but contains much impurities, though occasionally a good colored piece may be found. Ferruginous, small rounded stones are often slightly colored with iron oxide, giving the quartz a curious yellowish-red tinge, which, when the rock is translucent, produces a very beautiful effect. Some very curious boulders of a deep red color, resembling carnelian when polished and containing fissures and cavities running in every conceivable direction, are scattered through the park and elsewhere on the Island. When broken open, they are often found to contain very small bright-red crystals of quartz. Crystals are found as stated above and in round rocks or "cobble stones" containing cavities of a geodic character. I found one with a cavity measuring an inch and a quarter in width and filled with perfectly transparent crystals, measuring about an eighth of an inch in length. Quartz is also found as a conglomerate.

Tourmaline is occasionally found massive of a deep black color.

Many other specimens may be found here and often a rare specimen may be found in a vacant lot where excavating is going on. With a little patience and a strong hammer, the collector will find himself fully repaid for a day's "outing" among these rocks.

To Mine Iron Ore in New Jersey.

THE Belvidere Bessemer Iron Ore Company, with a capital of \$100,000, has been incorporated at Belvidere, N. J., with Robert L. Kennedy, T. P. Marshall, and Henry W. Kennedy, as incorporators, for the purpose of mining iron ore and converting it into steel.

NEW YORK MINERALOGICAL CLUB.

The ninth meeting of this Club was held at the residence of Rev. J. Selden Spencer, at Tarrytown, N. Y., on May 30, and was our first excursion as a Club.

Leaving the Grand Central Depot at 10:55 A. M., we arrived at Tarrytown at 12 M. after an hour's ride along the picturesque Hudson River, and found Tarrytown, although not a "Sleepy Hollow," a very beautiful little town.

Proceeding to Dr. Spencer's we opened our meeting at 12:30 with Dr. Spencer in the chair. After the reading of the minutes and a discussion of the Constitution and By-Laws, Dr. Sieberg offered a resolution which was adopted, that the Chair appoint a Committee of three, to confer with the officers of the Academy as to whether they would accept the Club as a branch of the Academy. Dr. Spencer then appointed Dr. Sieberg and Dr. Fredericks, and on motion of Mr. Kunz, Dr. Spencer was made the third member of the committee.

Since Dr. Spencer has so fine a collection of minerals, few of the members brought specimens for exhibition, Mr. Simmons exhibited beautiful Colemanite from California, Diopside from Arizona, Native Antimony, Prince William, York Co., New Brunswick.

After the meeting adjourned Dr. Spencer invited all to partake of a very fine and bountiful collation which he set before them. After lunch all repaired up-stairs to view Dr. Spencer's wonderful collection which we found had not been over praised. From then until 4:30 was spent examining it and all left it with a sigh of regret when at the invitation of Dr. Spencer, we visited the church of which he is pastor, and which Washington Irving attended, with whom Dr. Spencer was acquainted for six years. All of us availed ourselves of the privilege of sitting in the pew and on the very spot that Washington Irving occupied and to view the tablet to his memory in the wall, and of which Dr. Spencer gave us a very interesting history, while

his son, Washington Irving Spencer, gave us some excellent music on the organ. At 5 P. M. we all left for the depot having spent a very enjoyable day.

As late as forty years ago the great proprietors in the Ural were able to buy immense tracts of land for a few pounds of tea, and the boundries were marked almost at random, but now that the real value of the ground with its unexplored subterranean treasures is better estimated, the limits of each property are strictly defined by law. This marvelous region abounds with every variety of precious mineral. Gold, silver, platinum, copper, iron, emeralds, amethysts with that peculiar red fire so dear to the connoisseur in gems, aqua marinas, orange-hued topazes, malachite, lapis lazuli, porphyry, and others.

THE TAG GAZETTE.

A 4-page monthly paper, published in the interests of tag, stamp, coin, etc., collectors.

15 cents per year.

Sample copy free.

Advertising rates 35 cents per inch.

Special attention given to all kinds of job work.

Send for a sample copy. Address,

HARRY B. WILBER,
14 Main St., Cambridgeboro, Pa.

MINERALS.

Just received. One case of minerals on two ships, from Loo Poo Foo and Brintonperklomen-wheatley lead and copper mines.

Send for price and reference list.

T. J. LEWIS.

5710 N 22nd St.,

Philadelphia, Pa.

ORPIMENT

For sale, by single specimen or pound.
Address, J. C. LIGHTFOOT, JR., 307 Walnut Street, P.O. Box 1553, Philadelphia, Pa.

JUST RECEIVED.

A lot of Herkimer County Double-Terminated Quartz Crystals, which I can sell at 2½, 5, 10, 15, 20, 25, 35, and 50 cents each. These are the finest quartz crystals found in this country, and any collection not having some of them is not only incomplete but is without its most attractive specimen. One dozen lots 10 per cent. off.

A. CHAMBERLAIN,

284 PAVONIA AVE., JERSEY CITY, N. J.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of STAR RIDERS and Cyclists in General.

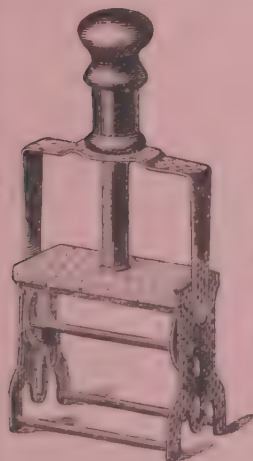
E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE**, East Rochester, N. H.

Make Money Orders and Drafts payable to E. H. CORSON.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.

**AGENTS WANTED.**

→ BIG PAY. ←

SEND STAMP FOR AGENTS' PRICE-LIST.

This **LITTLE GEM** self-inker, which is the best self-inker made, with one to four lines, complete, ready for use. **Only 75 cents.**

The **COLLECTOR'S STAMP**, 1 to 5 lines, with ink and pads, only 33c.

CIRCULARS FREE.

R. W. FORD,

Mfg. of all kinds of Rubber Stamps,

BRISTOL, - - - - - CONN.

FREE.

TO ANY COLLECTOR SENDING ORDERS FOR THREE OF THE ABOVE STAMPS, I WILL GIVE ONE EXTRA STAMP FREE.

WM. NIVEN,

DEALER IN

FINE MINERAL SPECIMENS

AND

OBJECTS OF ART AND GENERAL USE

MADE FROM

JASPERIZED WOOD, LABRADORITE,
CROCIDOLITE, CARNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, ETC., ETC.

A SPECIALTY MADE OF

JAPANESE CRYSTAL BALLS
OF ALL SIZES.

739 BROADWAY, NEW YORK.

**THE Corona NEWS-LETTER**

Issued every 2 weeks, 50 cents a year—Sample, 2 cts.

Address NEWS-LETTER, Corona, Bergen Co., N. J.

PHOTOS

FOR GENTS ONLY.

Sure to suit. 2 for 10c., 6 for 25c., 12 for 40c. Address, F. G. OSGOOD, Ann Arbor, Mich.

MINERALS

WE HAVE A LARGE STOCK OF FINE CABINET SPECIMENS OF MINERALS, AND ARE PREPARED TO FILL ORDERS FOR SINGLE SPECIMENS OR ILLUSTRATIVE COLLECTIONS OF ANY KIND, AT VERY REASONABLE FIGURES. WE INVITE ESPECIAL ATTENTION TO OUR FINE CRYSTALLIZED

WULFENITE, MALACHITE, AZURITE,
 VANADINITE, DESCLOIZITE, COLEMANITE,
 SPHALERITE, STIBNITE.

ALSO TO OUR MALACHITE ROOTS AND PSEUDOMORPHS AFTER AZURITE; GREENOCKITE COATINGS; IRRIDESCENT, CRYSTALLIZED CHALCOPYRITE.

WE HAVE A MOST COMPLETE STOCK OF FRANKLIN MINERALS, INCLUDING PERFECT SPECIMENS OF DYSLUTE, FOWLERITE, FRANKLINITE, GREEN TOURMALINE, CRYSTALLINE ZINCITE, TROOSTITE, AMAZON STONE (RECENTLY DISCOVERED), CALAMINE, CHALCOPHANITE, HETTEROLITE, AND GARNET.

WE HAVE THE
 LARGEST AND MOST MAGNIFICENT SPECIMEN OF CRYSTALLIZED STIBNITE IN THE WORLD; PRICE \$125.00.

ORDERS PROMPTLY FILLED. CORRESPONDENCE SOLICITED. TERMS CASH. GIVE US A TRIAL.

GEO. L. ENGLISH & CO.,
 DEALERS IN MINERALS,
 1512 CHESTNUT ST., PHILADELPHIA, PA.

VOL. XX.

NO. 10.

AUGUST, 1887.

THE

Price, 3 cents.

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| A TALK ON MINERALS, - - - - - | 73 |
| Apophyllite, - - - - - | 74 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - - - - | 75 |
| GOLD-BEARING QUARTZ IN MICHIGAN, - - - - - | 76 |
| CRISTOBALITE FROM MEXICO, - - - - - | 76 |
| EXCHANGES, - - - - - | 77 |
| ARE THE AMERICAN INDIANS, ETC., - - - - - | 78 |
| ARROW AND SPEARHEADS, - - - - - | 78 |
| ONE OF A COLLECTOR'S TRIALS, - - - - - | 79 |
| PHOSPHORIC ACID IN CHILI SALTPETER, - - - - - | 79 |
| NEW YORK MINERALOGICAL CLUB, - - - - - | 80 |
| AFRICA'S DIAMOND FIELDS, - - - - - | 80 |
| STUVENITE, - - - - - | 80 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.

A SAMPLE SELF-INKING STAMP which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc., all mailed free for 50 cts (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of STAR RIDERS and Cyclists in General.

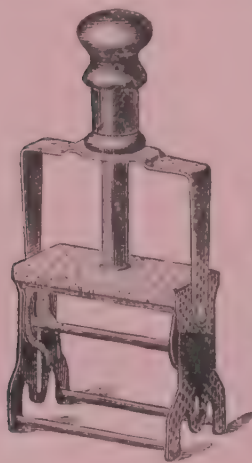
E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE, East Rochester, N. H.**

Make Money Orders and Drafts payable to E. H. CORSON.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.



AGENTS WANTED.

→ BIG PAY. ←

SEND STAMP FOR AGENTS' PRICE-LIST.

This **LITTLE GEM** self-inker, which is the best self-inker made, with one to four lines, complete, ready for use. **Only 75 cents.**

The **COLLECTOR'S STAMP**, 1 to 5 lines, with ink and pads, only **33c.**

CIRCULARS FREE.

R. W. FORD,

Mfg. of all kinds of Rubber Stamps,
BRISTOL. - - - - - CONN.

FREE.

TO ANY COLLECTOR SENDING ORDERS FOR THREE OF THE ABOVE STAMPS, I WILL GIVE ONE EXTRA STAMP FREE.

XXXX. XXXXX,

DEALER IN

FINE MINERAL SPECIMENS

AND

OBJECTS OF ART AND GENERAL USE

MADE FROM

JASPERIZED WOOL, LABRADORITE,
CROCIDOLITE, CARNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, Etc. Etc.

A SPECIALTY MADE OF

JAPANESE CRYSTAL BALLS

OF ALL SIZES.

739 BROADWAY.

NEW YORK.

THE Corona NEWS-LETTER

Issued every 2 weeks, 50 cents a year—Sample, free.



CLUBS.—The NEWS-LETTER will be forwarded FREE to any one sending us \$1.00 for 3 subscriptions.

Any one wishing to canvass for advertisements or subscriptions can retain 50 per cent. of amt. collected, and forward balance.

Agents wanted everywhere.

Address NEWS-LETTER, Corona, Bergen Co., N. J.

STAMP COLLECTORS!

Send 3 c. stamp, and a promise to return in 10 days, and receive an A1 approval sheet of genuine stamps. Address, SCHIAFINO & CO., P. O. Box 74, Guadalajara, Mexico.

THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., AUGUST, 1887.

NO. 10.

A TALK ON MINERALS.

By ARCHIE K. BATES.

PART III.

CRYSTALS.

THE regular forms which minerals assume are called crystals, and the process which it takes is called Crystallization.

Crystallization is much like solidification. Whenever a liquid becomes solid there is actual crystallization. When circumstances are favorable, regular crystals are of course formed; but most commonly the solid is a mass of crystalline grains, as in the case of statuary marble and a loaf of white sugar. Crystallization commenced at myriads of points at the same instant, in the case of marble, and there was no room for any to expand to a large size and regular outline. Simple crystals often increase to a large size when the process is slow.

By watching a solution of salt as it evaporates over a fire, one might get ideas on this subject of crystallization. After a while minute points of salt appear at the surface, if the process is not too rapid, and these continue enlarging. When they begin they are minute cubes, but they continue enlarging regularly on every side until they become so heavy they sink. In other cases, if the brine be boiled away too rapidly, a mass of salt may be found at the bottom of vessel, in which no crystals (cubes) can be seen; yet it is obvious that

the same power of crystallization was at work, and failed of yielding symmetrical solids, because of the rapidity of the evaporation. Crystals of salt have been found in the beds of this mineral a foot or more in breadth, which had been formed by natural evaporation, and the whole bed is in all cases crystalline in the structure of salt.

This subject may be further illustrated by many other substances. A hot solution of sugar, set away to cool, will form crystals on the bottom, or upon any thread or stick that may be put in the vessel. Melted lead and bismuth will also crystallize in the same manner. During the cold of winter, the vapors constituting clouds, often become changed to snow. This is a similar process of crystallization, for every flake of snow is an aggregation of crystals, and often they present the forms of regular six sided stars.

In the above examples we have presented three different modes of crystallization. In one case the substance is in a solution of water (or some solvent). The particles thus set free to move, and as the solvent passes off in evaporation, they unite and form the crystallizing solid. In the second case the substance is fused by heat; here again the particles remain free to move as long as the heat remains, and when it passes off solidification commences, under the power of crystallization. In the third case the substance is reduced to a vapor by heat, and from this state—also one of freedom of motion among the particles—it

crystallizes as the heated condition is removed.

We will drop this subject, however, and look into the formation of separate minerals.

First we will talk about the metals more valuable than gold.

VANADIUM.

Vanadium is a rare metal. It is found in nature as vanadic acid in the vanadate of lead and the vanadate of copper, and also combined with lime. The last named has a brick red color, a foliated structure, and a bright shining luster.

YTTRIUM.

Yttrium is not used in the arts. The species are infusible alone before the blowpipe or only in the thinnest splinters.

RHODIUM.

Rhodium is extremely hard and is used for nibs to gold pens. Its specific gravity is 21.8. Rhodium (1 to 2 per cent.) gives great hardness to steel, and would be a useful metal were it more abundant.

[TO BE CONTINUED]

APOPHYLLITE.

PART II.

In the closed tube Apophyllite exfoliates, whitens, and yields water, which gives an acid reaction. In the open tube, when fused with salts of phosphorous, gives the fluorine reaction. Before the blowpipe exfoliates, gives a violet flame (K), and fuses to a white enamel. It is decomposed by hydrochloric acid with a separation of a slimy silica.

Occurs commonly in amygdaloid and allied rocks, with various zeolites (chabazite, faroeite, thompsonite, and natrolite), occasionally in cavities and fissures in granite, gneiss, and metaliferous veins.

The Poonah and Ahmednugger, Tyrol, and Faroe Islands afford the finest specimens. Some of the noted localities are

Andreasberg, pink color owing to cobaltic fluoride, Orawicza and Czispłowa, in Transylvania, associated with wollastonite, Uto in Sweden, Nertschinsk in Siberia, Australia, Valencian, and Guaranjora, Mexico, pink variety in the later mine, which has not as yet been investigated.

In America, in the Lake Superior copper regions, Cape Blomidon, and Partridge Islands, in Canada, Bergen Hill, N. J., and El Paso Co., Colo. The latter has a world-wide fame for their exterior modified forms and their external structure, exhibiting such a variety of optical phenomena. These crystals have been fully investigated by Groth and Cross. Crystallographically and chemically by Chatard and Hellebrand.

The specie was established by Hany, in 1805, and named in allusion to the tendency to exfoliate before the blowpipe. Its pearly white aspect, which resembles the eye of a fish after boiling, influenced d'Andrada, in 1800, to name it Ichthyophthalmite, but his description was so defective, one might suppose it to be adularia or glassy feldspar, the specific gravity he gave was 2.491, even this being far out of the way. Therefore it is not a violation to the strictest rule of priority that Hany, who had made a very careful study of its crystallization, before it was known to d'Andrada. Therefore apophyllite should not yield to the place of the earlier one. The earliest analysis made of the specie was in 1805 by G. Rese and Fourcroy and Varquelin. Maceard has studied the species most carefully. This specie occurs altered to pectolite near Tiexno, on Monte Baldo, along with unchanged crystals.

[THE END.]

A VALUABLE gold mine has been discovered at Sonora Mexico. The pure metal is found native in the quartz in such large quantities that the miners obtain it by simply breaking the rocks with hammers and selecting the richest pieces from the debris.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART X.

THE HORNET STRIKES BACK - THE HUSKING PARTY HENRY GETS LOST.

His fun was short-lived, however, for before he had time to drop the pole, a hornet alighted on the back of his hand and commenced pegging away, while he jumped about shaking his hand as though he had burnt it; but the hornet would not let go and it was not till he knocked it off with his other hand that he got rid of it. He spent the rest of the afternoon plastering it with mud. It is needless to say that he did not interfere with any more hornets' nests.

We found in the woods some very large ant-hills, some of them three feet high, and the ants were so thick they crawled all over us, and you could not help stepping on them.

We found and gathered some very pretty ferns, both for transplanting and ornamenting our rooms.

We now left the woods and once more started off for a drive through the country. It was about four o'clock and just getting a little cool, so we had a very enjoyable ride along the shady road which runs from Hamburg to Deckertown; but it was getting time to start homeward, so we turned about and started for Franklin, stopping at the tourmaline locality to get some large specimens we had laid aside in the morning.

It was about 8 o'clock before we got back to the farm, where they had all made up their minds we had lost ourselves. But they nevertheless had a good supper awaiting us, which we soon made disappear in a lively fashion.

While we were eating our supper we were astonished at the number of persons who were arriving; but after supper we discovered that the farmer's daughter had invited all the young folks around Franklin to the house to a kind of husking-party.

So after supper we all repaired to the barn for a spree. There we found they had cleared the floor, spread down some new hay, and in the middle was an immense pile of corn ready to be husked.

Sitting down on the floor we set to work, or rather to play, and such a time we never had before. Talk about your city parties, if you want real fun and enjoyment you should attend a husking-party.

After we had got through with the corn, the floor was entirely cleared ready for a dance. The farmer brought out his fiddle, and we danced until almost midnight. The Virginia Reel seemed to be the favorite dance; in fact, round dances found little favor with the assemblage, almost all preferring square dances. It was almost 12 o'clock when the dancing stopped and we all set down to a long table which had been set out on the lawn, and ate all the ice-cream, cake, candy, nuts, apples, etc., that we could stuff down us.

After supper, as it was already Sunday morning, the party broke up, each of us seeing our partner home. A laughable incident of the evening was that Henry W. L., after seeing his girl home, lost his way coming back to the farm-house.

It seems that on starting back he thought he could save time by cutting across lots, but after walking about half an hour, he made up his mind he didn't know where he was, so he thought the best thing he could do was to retrace his steps, strike the road once more and make for home. But when he attempted to find the road he found he had as hard a task as finding the house.

After wandering about another half-hour he gave it up as a bad job, and finding as soft a spot as he could, he laid down and was soon fast asleep.

When he woke up it was just beginning to get light, and standing up to look around him, he found he had gone to sleep almost in his own door-yard.

He started for the house as fast and as noiselessly as he could. Getting to the house he cautiously opened the door, when the farmer shouted "Who goes there?"

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year.....\$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch......50

Per Column.....2.75

Per Page.....5.00

Liberal discount on standing ads.
Nothing less than a half-inch ad. taken.
Advertisements must be in by the 20th, and
exchanges by the 15th of the month to insure in-
sertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

WE have received from John M. Hubbard, Lake Village, N. H., a copy of the Third Edition of his Premium Coin List, just published. This is a very handy book to have as by reference to it you will often find premiums on coins which you have received in change. Price 10 cents.

MR. GEORGE F. KUNZ, of Tiffany & Co., New York, was sent, accompanied by Mr. J. S. Diller, of the U. S. Geological Survey, to examine the peridotite of Elliott Co., Kentucky. The occurrence there of carbonaceous shale in it closely resembles the same rock at the South African Diamond Fields, and although diamonds were not found, yet valuable observations were made on this most interesting occurrence, which will be published later by the Survey in a paper on the subject.

Gold-bearing Quartz in Michigan.

A DISPATCH to a Chicago paper, dated July 14, from Ishpeming, Mich, says: "Assays of the quartz found on the gold prospect of the Lake Superior Iron Com-

pany, west of the city, gave \$13 in gold from twelve ounces of rock, or \$35,000 gold to the ton. Miners have traced a vein 200 feet on the surface. A storehouse is now being built to hold the rock. More rock as rich as the first was taken out yesterday."

Andalusite from Marabastad, Transvaal.

By J. GÖTZ Jahrb. f. Min., 1887).

It has been stated that the andalusite in the otterelite and andalusite schists of the Marabastad gold-fields in the Transvaal, might be distene. The author has consequently made a fresh investigation of the mineral in question. The specific gravity equals 3.4; that of distene is considerably greater. An analysis yielded: SiO_2 28.38, Al_2O_3 56.50, TiO_2 15.14, Total 100.02. The mineral cannot be distene on account of its specific gravity and the absence of perfect cleavage.

Cristobalite from Mexico.

By G. VON ROTH (Jahrb. f. Min., 1887, 1, Mem., 198 199).

NEAR the summit of Cerro S. Cristobal, near Pachuca, in Mexico, the author has found some white, regular crystals associated with tridymite. Their hardness was 6-7, and their specific gravity 2.27. Analysis of a minute quantity gave the following results: SiO_2 91.0, Fe_2O_3 6.2, with some Al_2O_3 , Total 97.2. These regular crystals consist essentially of silica. The question then arises, are the crystals pseudomorphs, or do they represent a new octahedral form of silica? This can only be solved by collecting further material. Should it be desirable to give a name to this mineral, the author suggests that of Cristobalite, from the locality where it is found.

WE have on file a number of interesting articles which will shortly appear, for which we return thanks.

✧ Exchanges ✧

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

A kinds of receipts to exchange for tags, etc.
A. A. BUZZARD, Austin, Oakland County, Cal.

Minerals in exchange for same. Send list.
J. C. L., JR., 307 Walnut Street, Philadelphia, Penn.

Fifty large fine minerals, at least 2x3, for a printing press. A. E. HAMMOND, Willimantic, Conn.

Fine minerals to exchange for good minerals.
J. C. LIGHTFOOT, JR., P. O. Box 1553, Philadelphia, Penn.

Tags for tags. Send lists. Postmarks for tin tags. PHILIP A. CRAPO, 513 N. Sixth Street, Burlington, Iowa.

Fifty different foreign coins, many rare, a fine collection, for a small cent of 1856. Also have U. S. coins to exchange. H. T. UPSON, Parkersburg, W. Va.

Will exchange books, minerals, fossils, amateur and stamp papers, for fossils. A good L. S. fossil for every other fossil sent me. F. C. JOHNSON, Boonville, N. Y.

One font of German text-type, one ink-roller handle, also a lot of fine fossils, sea curiosities, minerals, etc., for coins or department stamps. W. P. ARNOLD, Shannock, R. I.

Fine minerals to exchange for others not in my collection. All correspondence promptly answered. Please send lists. GEO. W. HOBSON, 4555 Wakefield St., Germantown, Phila., Pa.

I will exchange a small printing press with seven fonts of type, ink rollers, ink, gold bronze, and cards, altogether, for a good scroll saw or lathe, or for the best offer of books of equal value. WM. SUTHERLAND, P. O. Box 34, Viola, New York.

Wanted, U. S. revenues, match-wrappers, fractional currency, medals, coins, and rare postage stamps, for which I will give U. S. revenues or rare foreign stamps. Collectors having any of my wants will do well to write me. W. F. YOUNG, 61 Vale St., Roxbury, Mass.

A Baltimore No. 3 self-inking revolving ink-plate printing-press, chase $2\frac{1}{2} \times 4$ inches, seven fonts of type in cases, ink, composing stick, and complete outfit, and a collection of U. S. cents from 1793 to 1887, except four dates, for a spy-glass telescope, scroll-saw with lathe, or bicycle. W. H. TAYLOR, North Wales, Montgomery Co., Penn.

Minerals, books (paper bound), postmarks, and receipts to exchange for minerals, fossils, Indian relics and curiosities, or books on minerals, ornithology, or taxidermy. JAS. W. SHETTEL, York City, Pa.

Volumes LVII, LVIII, and LIX, of Youth's Companion (unbound), in good order, for books (no fiction), sets of natural history specimens, or offers. ABRAM A. HALSEY, Water Mills, Suffolk Co., N. Y.

I will exchange one unused ten-cent Confederate stamp, blue, for U. S. Document stamps. Also a fine Indian pestle for other U. S. stamps and foreign stamps. WILL TIPP MILLER, P. O. Box 45, Parkersburg, W. Va.

A 2x2 in. specimen of either pink granite, geode, green feldspar, iron ore, or fossil coral, for 3 star fishes, 3 shark's eggs, 3 sea urchins, 8 sea beans, horseshoe crab, or a V-nickel without cents. L. H. HENRY, Bonaparte, Iowa.

Will exchange a Flobert rifle, eureka type-writer, fine silver watch, one Grafflin 1 ct. black Baltimore dispatch stamp, catalogued \$10, guaranteed genuine, and other curiosities, for stamps of any kind. F. N. MASSOTH, JR., Hanover Center, Ind.

I have for exchange the following minerals: Ligniform asbestos, black marble, black hornblende, black tourmaline, calc-spar, calcareous tufa, copper pyrites, talcose rock, calcite. Please send lists for exchange. F. H. BLANCHARD, Tunbridge, Vt.

To exchange, Robinson Crusoe complete, three other books, one Excelsior Safety Gas-burner, \$4 worth fluid ink-eraser and ten ink recipes for magic lantern or revolver, or any useful article worth \$2. All letters answered. A. C. BUZZARD, Austin, Oakland Co., Mich.

Will exchange for a good double-barrel breech-loading shot-gun, an old-fashioned grandfather's clock which is over 100 years old, is in perfect running order, handsome walnut case, registers the days of the month, is about $7\frac{1}{2}$ feet high, or will sell for \$25.00 cash. AZARIAH MORE, Bridgeton, N. J.

Kyanite (blue), lepidolite (gray and purple), idocrase, beryl, staurolite, tourmaline, muscovite, biotite, prehnite, quartz crystals, bog iron ore (with fossils), feldspar, graphic granite, fuchsite (green mica), and garnets, to exchange for other good specimens of minerals. H. W. NOYES, Box 1716, Portland, Maine.

A Worcester's letter writer and book of business forms, Quackenbos' Philosophy, 44 cal. revolver, shading-pen and alarm clock, for Waterman's fountain-pen or opera-glasses. Also a new Roger's scroll-saw, worth \$3.50, for set of 8-ounce boxing-gloves, Flobert rifle, or books. Send offers. W. W. JONES, 1218 Market St., Parkersburg, W. Va.

❖ Archaeology ❖

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

ARE THE AMERICAN INDIANS DESCENDANTS FROM THE ANCIENT MOUND-BUILDERS?

By EDGAR J. KLOCK.

THIS question was again brought before the mind of the Archæologist by the remarkable discovery of an old Indian village, the remains of which the spring freshets recently brought to light on the flats at the junction of the Charlotte and the Susquehanna, some two miles above Oneonta, N. Y. The top soil, in this locality, abounds in the Indian stone relics of a traditional village that was on the site, but no specimens of pottery were ever found prior to the present discovery.

Probably, the soil had not been disturbed for ages until the field was plowed last fall. This spring the freshet took the form of a slow current across this flat, washing away the fine alluvial soil, and thus cutting a channel some two rods wide and as many feet deep to the clay subsoil beneath. As the light soil filtered away, objects of greater weight were left behind, and when the overflow subsided a vast number of fragments of rude pottery, together with flint chips, spear and arrow points, drills, hammers, sinkers, and other objects of Indian workmanship, were disclosed along the bed of the gully. In several places remains of ancient fire-places, containing fragments of charcoal, left over, perhaps, from the last fires kindled in them centuries ago, were exhumed, but the most interesting part of the find was the pottery, some 2,000 pieces of which were picked up within a few square rods. It consisted of both the plain and ornamented varieties, many specimens of the latter showing very intricate and curious patterns, among them one on which was traced the rude outlines of a human face. The most noticeable fact was that the pottery, both plain and ornamented, was

identical with that taken from the western mounds, showing conclusively that some connection must have existed between those two races of the past.

Several of the so-called Indian mounds exist near and around Oneonta, which, no doubt, hold in their dark, earthy tombs a vast store of mute records which would throw valuable light on the lost history of that dead and almost forgotten race.

Who will undertake to unearth them for us? Why wait for another generation to make the search?

Arrow and Spearheads.

By W. T. MILLER.

ARROWHEADS are picked up all over the United States, by collectors and others, and are of many hundred shapes and various sizes, forms, and color. They are made of a very hard substance, such as flint, jasper white quartz, etc.

The supposition is that the smallest ones are used on small game alone. The triangular darts are war-darts, and are used in war alone. Spearheads are distinguished by their size, all points over two and a half inches in length (unless very light) are admitted to be spearheads. They often reach 7 to 8 inches in length. I have one in my collection which measures 8½ inches, and was found at Moundville, West Va.

Many fine implements have been found on the outskirts of Parkersburg, W. Va., also several hundred fine arrow and spearheads, from one-quarter to five inches in length, also tomahawks, axes, pipes, and knives.

In order to learn why there is so much sulphur in stone coal and so little of free alkaline carbonates in the ashes, M. Dieulafoy has analyzed the surviving species of the families of coal plants, particularly the Equisetaceæ, and has found in them an unusually large portion of sulphuric acid. He concludes, therefore, that the coal plants were more highly charged with sulphur than most existing plants.

ONE OF A COLLECTOR'S TRIALS.

By J. W. S.

HAVE you ever taken notice how a non-collector handles a specimen? I am completely ill at ease when any of my specimens are in the hands of such a person. If you have your minerals in a case, a well bred person should not offer to raise the lid and take a specimen from it, but it seems for the time being they forget their good manners, and very often their common sense. Some one may ask permission to handle a specimen for the purpose of examining it closely. You do not like to refuse, and one of your fine specimens is taken up in the hands of one who admires it for its beauty and not for its value. It very often happens that the specimen the person desires to examine is one of those brittle minerals; one that will bear handling just to a certain extent. From the appearance of the mineral such is the case, but, alas! that deplorable trait of human nature, curiosity, inherited from Mother Eve.

While you are engaged with something else and have not your thoughts at the time on that specimen, you are brought to your senses by a dull grating sound, and a meant to be sympathetic:

"Oh! I really did not mean to do it. I'm awfully sorry."

You may mutter, "Oh! it is no matter," but all the same you know that that breaking of the specimen almost similarly affected your heart.

You no doubt recall how hard you toiled for that piece of stone; the long walk in the broiling sun, a scramble up the hills and then perhaps a descent into the earth with only a frail rope for support, which every instant threatened your destruction. The specimen you worked so hard for is broken and the cause of the sad havoc has not the power to replace it.

The explanation generally offered is, "I did not think it would break. I only tested it the least bit." Yet he tried to break it. If any one tests the strength of a body they expect it to yield, and if it does not it is a sort of disappointment. Minerals do not

possess elasticity or flexibility, they cannot be drawn out nor bent, and no one with common sense would expect such to be the case.

A good way for collectors to protect themselves, would be to secure your case with lock and key, and then manage to lose the key, or else have placard with the pointed information: "To look at but not to handle."

If this article is read by a non-collector, please do not judge a collector harshly if he does not desire you to handle his specimens. A collector cherishes his specimens as a part of his existence, and to ruin a specimen is to make him miserable.

Phosphoric Acid in Chili Saltpeter.

By C. ACHSENIUS (SAHOB. f. Min. 1887).

THE principal argument always brought forward against the theory of the formation of Chili saltpeter from Guano, was no phosphoric acid could be detected in the nitrate. The ordinary analytical methods gave only negative results. The author has carefully examined a series of strata from the nitrate beds of Taltre, in the Chilian province of Atacama. He employed Streng's microchemical method and obtained the unmistakable green rhombic dodecahedra of molybdenum-ammonium phosphate in the specimens from above the nitrate deposit, and in the ordinary sodium saltpeter. No phosphoric acid could, however, be detected in the white, crystalline nitrate, or in the beds below the deposit.

THE investigations of the Prussian Fire-damp Commission have shown that many explosions attributed to fire-damp, are due to fine coal dust, all kinds of dust appearing to be capable of exploding violently when ignited. The experiments of this inflammability of coal dust were devised in accordance with the conditions prevailing in practice, and 200 tests were made, explosions occurring in every case when an electric spark was produced.

NEW YORK MINERALOGICAL CLUB.

THE tenth meeting of this Club was held at the residence of Mr. B. B. Chamberlain, 247 W. 125th St. on June 28th.

Mr. Geo. F. Kunz, our secretary, being absent on an expedition for the W. S. Geological Survey, Rev. J. Selden Spencer was made temporary secretary.

The committee appointed at the last meeting to confer with the Academy authorities relative to making our Club a branch of the Academy, reported that the project was very favorably received, and had been referred to the Council, which meet in September.

Mr. Niven, Mr. Mathe, and Mr. Hidden then exhibited a number of interesting specimens.

Mr. Hutchins offered a resolution, which was adopted, changing our next meeting into an excursion, to take place either on the 16th or 23d of July, at Weehauken. Mr. Braun promised to bring drill and powder for blasting.

After the meeting Mr. Chamberlin served refreshments which were enjoyed by all.

Before and after the meeting the members availed themselves of the opportunity to look over Mr. Chamberlin's collection of New York City and Bergen Hill minerals, which are unsurpassed.

AFRICA'S DIAMOND FIELD.

THE HISTORY OF THE DISCOVERY OF PRECIOUS STONES ON THE ORANGE.

In a farm-house, with its large table and bureau bearing a Bible and two or three old Dutch books, and the clumsy rifle leaning in the corner, after the evening reading of a chapter in the Boer fashion, a trader named Niekirk, who chanced to be present, told the vrouw Jacobs that the great white shining stones they had just been hearing of reminded him of the pebbles the children played with, picked up along the banks of the neighboring Orange River. As he spoke,

there entered O'Reilly, an ostrich hunter. They tried one of the stones on the window glass and scratched it all over, the scratches remaining there till this day. It was agreed if it turned out a diamond all were to share equally. On his way to Cape Town O'Reilly showed the stone, and was laughed at for his credulity; it was even taken from him, and recovered with difficulty from the street where it had been thrown; but "he laughs best who laughs last," for in Cape Town the pebble from the banks of the Orange was pronounced to be a diamond, and bought by Sir Philip Wodehouse for £500. Ten more such were easily found by the vrouw Jacobs, and early in the next year, 1868, several were picked up along the banks of the Vaal, among them the renowned Star of South Africa by a Hottentot shepherd, who sold it to Niekirk, the trader, for £400, who deposed of it on the same day for \$60,000. Then the rush began in earnest, first to Pniel and the river diggings on the Vaal Pniel, which stretched with its sea of tents, its hive of men and checker of claims, down to the loud and busy river, and up again to the populous height of Klipdrift. Here and there, but rarely upon the slope, a canteen of dirty canvas, or a plank-built store with roof of corrugated iron; upon the slope, all pocked with holes, so that all looked like some rude and careless cemetery. Within three months of the first discovery of diamonds at this place there were 5,000 digging there. -- THE CORNHILL MAGAZINE.

Stuvenite.

By L. DARAPSKY, J. HERB. f. Min., 1887.

AN alun found in some abandoned workings at Alcaparrossa Mine, near Copiapo Chili, gave on analysis the following results: H_2O 47.6, So_3 36.1, Al_2O_3 11.6, MgO 1.0, Na_2O 2.7, K_2O trace, Total 99.0. The formula is: $Na_2O, So_3 + MgO, So_3 + 2(Al_2O_3, 3So_3) + 48H_2O$. For this well characterised species the author proposes the name of Stuvenite, in honor of Enrique Stuven.

MINERALS

WE HAVE A LARGE STOCK OF FINE CABINET SPECIMENS OF MINERALS, AND ARE PREPARED TO FILL ORDERS FOR SINGLE SPECIMENS OR ILLUSTRATIVE COLLECTIONS OF ANY KIND, AT VERY REASONABLE FIGURES. WE INVITE ESPECIAL ATTENTION TO OUR FINE CRYSTALLIZED

WULFENITE, MALACHITE, AZURITE,
 VANADINITE, DESCLOIZITE, MILLERITE,
 SPHALERITE, STIBNITE, ZIRCON.

ALSO TO OUR MALACHITE ROOTS AND PSEUDOMORPHS AFTER AZURITE; GREENOCKITE COATINGS; IRRIDESCENT, CRYSTALLIZED CHALCOPYRITE, VELVET CHALCOPRITE, BLUE AND ORANGE CALCITE, ACTINOLITE.

WE HAVE A MOST COMPLETE STOCK OF FRANKLIN MINERALS, INCLUDING PERFECT SPECIMENS OF DYSLUTE, FOWLERITE, FRANKLINITE, GREEN TOURMALINE, CRYSTALLINE ZINCITE, TROOSTITE, AMAZON STONE (RECENTLY DISCOVERED), CALAMINE, CHALCOPHANITE, HETTEROLITE, AND GARNET.

Minerals for Commercial and Technical Purposes A SPECIALTY.

ORDERS PROMPTLY FILLED. CORRESPONDENCE SOLICITED. TERMS CASH. GIVE US A TRIAL.

GEO. L. ENGLISH & CO.,
 DEALERS IN MINERALS,
 1512 CHESTNUT ST., PHILADELPHIA, PA.

The Tag and Stamp Gazette.

A 4-page monthly paper, published in the interests of tag, stamp, coin, etc., collectors.

15 cents per year.

Sample copy free.

Advertising rates 35 cents per inch.

Special attention given to all kinds of job work.

Send for a sample copy. Address,

HARRY B. WILBER,
14 Main St., Cambridgeboro, Pa.

JUST RECEIVED.

A lot of Herkimer County Double-Terminated Quartz Crystals, which I can sell at 2½, 5, 10, 15, 20, 25, 35, and 50 cents each. These are the finest quartz crystals found in this country, and any collection not having some of them is not only incomplete but is without its most attractive specimen. One dozen lots 10 per cent. off.

A. CHAMBERLAIN,

284 Pavonia Ave., Jersey City, N. J.

OPAIS from Honduras. Specimens of this beautiful mineral showing different shades of red and green, from 25 cents to \$1. **A. CHAMBERLAIN,** 284 Pavonia Ave., Jersey City, N. J.

OCCURRENCE AND FABRICATION OF Rock Crystal, with five illustrations, as contained in Nos. 1-4, Vol. II., of **EXCHANGERS' MONTHLY**, price 10 cts.

LOOK AT THIS.

| | |
|----------------------------|---------|
| Polished Crocidolite. | 30 cts. |
| " Agatized Wood. | 25 " |
| " Agates. | 25 " |
| Cuprite Crystals. | 25 " |
| Almandine Garnets. | 25 " |
| Azurite Crystals. | 25 " |
| Sphalerite. | 15 " |
| Kyanite. | 15 " |
| Calamine Crystals. | 25 " |

ARTHUR CHAMBERLAIN,

284 Pavonia Ave., Jersey City, N. J.

BEAUTIFUL CRYSTALS!

For \$1 I will send by mail 25 of the celebrated

DOUBLY TERMINATED

QUARTZ CRYSTALS,

found only in this locality. They are remarkably brilliant and the finest found in the U. S. No collection complete without them. Satisfaction guaranteed.

A. B. CHAM,
Middleville, Herkimer Co., N. Y.

THE ARIZONA MINERAL COLLECTION.

PUT UP BY

MR. WILLIAM NIVEN,

Late Assistant-Commissioner, Arizona Territory,
World's Fair, New Orleans

ONLY 50 CENTS A BOX.

This is the most attractive collection that has yet been put in the market, and should meet with a large sale. It consists of 12 specimens packed in cotton in a partitioned box each accompanied by a printed list giving name of mineral, composition, etc., together with an engraving of the Natural Bridge, Chaledony Park, Arizona Territory, which is made entirely of the wood of which this collection contains a piece. Each box contains:

FLUORITE.

FREE GOLD.

CHALCOITE.

MALACHITE.

CHALCOPYRITE

SMOKY QUARTZ.

NATIVE COPPER.

JASPERIZED WOOD.

AZURITE CRYSTALS.

CUPRITE ON LIMONITE

ARGENTIFEROUS GALENA.

ARGENTIFEROUS QUARTZ

For sale by

A. CHAMBERLAIN,

284 Pavonia Ave., Jersey City, N. J.

MONEY

made easy Manufacturing
Rubber Stamps. Send for
Price List of Outfits. to
J. F. W. DORMAN, No. 217
East German Street, Bal-
timore, Maryland, U. S. A.

NINE MINERALS from Franklin
and Bergen Hill, New Jersey at Low Prices.
Also a number of fine specimens from other
places. Let me know what you want and I will
send price. **E. G. MATHIS,** 294 Pavonia Ave.,
Jersey City, N. J.

VOL. XX.

NO. 11.

SEPTEMBER, 1887.

THE

Price, 3 cents.

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| A TALK ON MINERALS, - - - - - | 81 |
| ARTIFICIAL RUBIES, - - - - - | 82 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - - - - | 83 |
| OREGON'S DEEPEST LAKE, - - - - - | 84 |
| QUEER WAY TO GROW RICH, - - - - - | 84 |
| EXCHANGES, - - - - - | 85 |
| SNAKE AND SNAKE-LIKE MOUNDS IN MINNESOTA, - - - - - | 86 |
| A NECKLACE OF HUMAN FINGERS, - - - - - | 86 |
| MINERALS OF TULARE CO., CAL., - - - - - | 87 |
| FINDING A DIAMOND OF GREAT BRILLIANCY, - - - - - | 87 |
| NEW YORK MINERALOGICAL CLUB, - - - - - | 88 |
| IS THERE A DIAMOND FIELD IN KENTUCKY, - - - - - | 88 |
| SAVING THE SMALL PIECES, - - - - - | 88 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.

Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.

BLACK HILLS' MINERALS.

Cerargyrite (horn silver), 15c. to \$1.20. Ruby Silver, 30c. to \$1.20. Native Silver, 60c. to \$2.00. Free Gold, 60c. to \$5.00. 30 GOOD SIZE specimens of Black Hills' Minerals for only \$1.25. Send cash in registered letter.

D. L. PERRINE, Water Valley, N. Y.

A SAMPLE SELF-INKING STAMP which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc., all mailed free for 50 cts (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

WM. NIYEN,

DEALER IN

FINE MINERAL SPECIMENS

AND

OBJECTS OF ART AND GENERAL USE

MADE FROM

JASPERIZED WOOD, LABRADORITE,
CROCIDOLITE, CARNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, Etc., Etc

A SPECIALTY MADE OF

**JAPANESE CRYSTAL BALLS
OF ALL SIZES.**

739 BROADWAY, NEW YORK.

FOR THE BOYS.

Lovely Favorites have been Photographed from life in the most bewitching and enchanting manner, and expressly for us. We will send 12 for 25 cents and give you THE LITERARY VISITOR one year free. L. R. TONEY, Richmond, Ind

MONEY

made easy Manufacturing Rubber Stamps. Send for Price List of Outfits. to J. F. W. Dorman, No. 217 East German Street Baltimore, Maryland, U S A.

OPALS from Honduras. Specimens of this beautiful mineral, showing different shades of red and green, from 25 cents to \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of STAR RIDERS and Cyclists in General.

E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE, East Rochester, N. H.**

Make Money Orders and Drafts payable to E. H. CORSON.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.

THE Corona NEWS-LETTER

Issued every 2 weeks, 50 cents a year—Sample, free.



CLUBS.—The NEWS-LETTER will be forwarded FREE to any one sending us \$1.00 for 3 subscriptions.

Any one wishing to canvass for advertisements or subscriptions can retain 50 per cent. of amt. collected, and forward balance.

Agents wanted everywhere.

Address NEWS-LETTER, Corona, Bergen Co., N. J.

STAMP COLLECTORS!

Send 3c. stamp and a promise to return in 10 days, and receive an A1 approval sheet of genuine stamps. Address S. HAFINO & CO. P. O. Box 74, Guadalajara, Mexico.

BEAUTIFUL CRYSTALS!

For \$1 I will send by mail 25 of the celebrated

DOUBLY TERMINATED QUARTZ CRYSTALS,

found only in this locality. They are remarkably brilliant and the finest found in the U. S. No collection complete without them. Satisfaction guaranteed.

A. B. CHIM.

Middletown, Herkimer Co., N. Y.

SPORTSMAN'S

Knife, two blades with cork-screw, screw-driver, and hoof-cleaner stag or bone handle, valued at \$1, will be given free for only two subscribers to THE LITERARY VISITOR, at 25 cents each, and 10 cents extra for postage on the knife. L. R. TONEY, Richmond, Ind.

THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. II.

JERSEY CITY, N. J., SEPTEMBER, 1887.

NO. 11.

A TALK ON MINERALS.

By ARCHIE K. BATES.

PART IV.

METALS MORE VALUABLE THAN GOLD—IMPLEMENTS NEEDED.

PALLADIUM.

NATIVE PALLADIUM occurs in regular octahedrons and also in hexagonal tables. Occurs mostly in grains, apparently composed of divergent fibers. Color, steel gray, inclining to silver white. Ductile and malleable. Hardness above 4.5. Sp. Gr., 11.8–12.2. This metal when polished presents a splendid steel-like lustre which will not tarnish. One part fused with six of gold, forms a white alloy. This metal is often used in the manufacture of surgical instruments, and large masses of it are brought from Brazil. A cup weighing $\frac{3}{4}$ pounds was made by M. Bréant in the mint at Paris, which is now the “garde-meuble” of the French crown.

There are many other metals more valuable than gold, but for want of space I omit them, their value being derived mostly from their scarcity,

To me one of the most curious minerals is Mercury.

Mercury occurs native, alloyed with silver, and in combination with sulphur, chlorine, or iodine. Its ores are completely volatile, excepting the one containing silver.

NATIVE MERCURY.

Monometric; in octahedrons. Occurs in fluid globules scattered through the gangue. Color, tin white. Sp. Gr., 13.6. Becomes solid and crystallizes at a temperature of 39 degrees Fahr.

Mercury, or quicksilver, as it is often called (a translation of the old name “argentum vivum”), is entirely volatile before the blowpipe, and dissolves readily in nitric acid.

Native mercury is a rare mineral, yet it is met with at the different mines at Almaden, in Spain, Idria, in Carniola (Austria), and also in Hungary and Peru. It is used principally in silvering mirrors and in thermometers and barometers, and for various purposes connected with medicine and art.

SULPHURET OF MERCURY,

When pure, consists of Mercury 86.29, Sulphur 13.71, but is very often impure.

Before we close this article, perhaps a few words about the implements a mineralogist should have for the examination of minerals, would not be out of place.

1. A three-cornered or small flat file for testing hardness.
2. A knife with a pointed blade of good steel, for trying hardness.
3. Small glass-stoppered bottles (one ounce) of each of the acids (muriatic, sulphuric, and nitric) in a dilute state.
4. A blowpipe.
5. The common fluxes.
6. A candle or lamp for blowpipe trials.

7. Pieces of charcoal for blowpipe. Also mica or platinum for holding the assay.

8. Platinum foil, wire, and forceps.

9. Also a pair of steel forceps for holding fragments and for managing assay.

10. A piece of glass tube $\frac{1}{8}$ -inch bore, and two or three test-tubes for trying the action of acids.

11. A pair of cutting pliers for chipping minerals for blowpipe and chemical assay.

12. A common goniometer, or a pair of arms pivoted together to use with a scale.

13. A pair of balances for specific gravity.

14. A hammer weighing two pounds, resembling a stone-cutter's hammer.

15. A hammer of half a pound weight, for trimming specimens.

16. A small jeweler's hammer for various purposes requiring a light hammer.

17. A piece of steel, say $\frac{1}{2}$ -inch thick, 1 or 2 inches wide, and 2 or 3 inches long, to be used as an anvil.

18. Two steel wedges, or chisels, one 6 inches and the other 3 inches long.

19. Bone ashes to be used upon mica.

20. A pocket microscope.

21. A small agate mortar and pestle.

22. A magnetic needle.

23. A pair of scissors.

24. A box of matches.

For blasting and other heavy work much heavier tools are necessary.

It is best to take plenty of drills and wedges, a sledge-hammer, a crowbar, a pickaxe, a hoe, and blasting materials, with a patent fuse or slow match.

[THE END.]

ARTIFICIAL RUBIES.

By GEORGE F. KUNZ.

THE author recently read a paper before the New York Academy of Sciences on some artificial rubies that have been offered in the market of Paris as genuine rubies from a new locality.

On examination of specimens of the stone the author found their principal

distinguishing characteristic to be the presence of spherical bubbles, rarely pear-shaped, or having stringy portions showing how they had moved, but with the ends always rounded, and presenting a cloudy appearance or an arrangement in wavy groups. In natural rubies the cavities are always angular or crystalline in outline, and are usually filled with liquid; or, sometimes they are arranged with the lines of growth, forming part of a feather, as it is called by jewelers. In many genuine rubies we find a silky structure which appears under the microscope to be a series of cruciform or acicular crystals, usually iridescent. No traces of these have been found in the artificial specimens. The stones are about equally hard and of nearly equal specific gravity with genuine rubies. Their color is good, but not so brilliant as that of a very fine ruby. The syndicate of diamond and precious stones of Paris has directed that all stones of this kind shall be marked artificial, else they will be considered fraudulent, and sellers of them will be dealt with accordingly.

WHAT is known as the Great Southern Cross Pearl is one of the curious things exhibited at the Colinderies, or Colonial Exhibition in London. This object is one of the most remarkable freaks of nature as it is also one of the most beautiful and valuable. The jewel consists of nine pearls naturally joined together in the form of a cross, and was found at Roeburn, Western Australia, in 1883, by a man belonging to the schooner *Ethel*. The owner, "Shiner Kelly," and Clark, the man who found the pearl, were filled with amazement, and, thinking it was some heaven-wrought miracle and with a certain amount of superstitious dread, buried it for some time. It is valued at £10,000, and is now the property of a syndicate of gentlemen of position in Western Australia, at whose solicitation Mr. Streeter was induced to bring it to England. It has changed hands many times and each time it has done so the seller has made 100 per cent. profit on the price paid.

* Exchanges *

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

Fifty-two numbers of Peck's Sun, for 1886, for best offers. Address, L. R. TONEY, Richmond, Indiana.

Indian relics to exchange for good minerals. Send lists. ELLA F. BOYD, Box 207, Hyde Park, Mass.

Forty fine minerals, from 2x3 to 4x5, to exchange for a pair of opera-glasses. A. E. HAMMOND, Willimantic, Conn.

Indian relics of all kinds, of all sizes, and of all shapes, to exchange for U. S. coins. H. T. UPSON, Parkersburg, W. Va.

Fine trilobites (*Phacops latifrons*), perfect, for sale or exchange, for specimens equally as choice. J. G. WAINWRIGHT, Waukegan, Ill.

Tags to trade with others having over seventy-five different tags to trade. Send lists. PHILIP A. CRAPO, 512 North Sixth Street, Burlington, Iowa.

Two ounces of soil from this state for two ounces from any other State or Territory. A stamp album wanted in exchange for other articles. ULYSSES CLARK, Pipestone, Minn.

Books, papers, skate's eggs, and bird's eggs, for old cents, stamps, Indian relics, minerals, or bird's eggs not in my collection. ABRAM A. HALSEY, Water Mill, Suffolk County, New York.

Wanted, match wrappers, state revenues, fractional currency, medals, coins, proof revenues, and quartz crystals, for which I will give rare U. S. revenues or foreign postage stamps. W. P. YOUNG, 61 Vale St., Roxbury, Mass.

Good exchanges in foreign stamps for U. S. match, medicine, document, and proprietary stamps. Complete files of all philatelic papers wanted in exchange for stamps. Bird's eggs and novels in exchange for philatelic literature of any kind. J. M. DOUGLASS, JR., Middletown, Conn.

I will give ten varieties foreign stamps for any of the following papers in good condition and complete. The Exchange List, Hatfield, Pa.; The Advance, Brattleboro, Vt.; People's Exchange, Springwater, N. Y.; The Stamp World, Cincinnati, O.; The Hatchet, Greenfield, Mass.; American Youth, Danbury, Conn.; The Advertiser, Standeard, P. Q.; Exchange and Mart, Boston, Mass. Send by mail, postpaid, and I will send stamps by return mail. F. S. GOLDSBURY, Box 4, Barre, Vt.

A foreign stamp for every tin tobacco tag. T. J. CALKIN, 25 Maiden Lane, Binghamton, New York.

Fifty different and rare tin-tags for postmarks. Send lists. GOTTFLEIB RAEGER, Terre Haute, Indiana.

V-nickels without the word cents for Indian relics. G. M. SANBORN, 599 N. Tennessee St., Indianapolis, Ind.

Specimens of minerals for Dana's book on mineralogy. BRET. H. MEACHAM, West View, Goochland Co., Va.

A specimen of fossil shell, a bleeding-tooth shell, and a piece of copper ore, for minerals or foreign coins. FRANK VAN BUREN, 263 York Street, Jersey City, N. J.

Minerals and curiosities to exchange; also a reliable receipt for polishing stones and agates, for every small mineral or curiosity sent me. FRANK S. FOOTE, 385 Lyon St., Grand Rapids, Mich.

Will exchange for a type-writer, one dozen Excelsior Gas-burners, materials and instructions for painting oligraphs, and a revolver. All letters answered. EDWIN GRAY, Ledyard, New Lardar Co., Conn.

A large collection of U. S. and foreign stamps to exchange for minerals, Indian relics, or ocean curiosities. Philatelic and scientific papers for the same. A hectograph wanted. State what you want. W. H. PLANK, 435 Minnesota Ave., Wyandotte, Kan.

Fine cabinet minerals to exchange for birds eggs in sets, or for other minerals. Bolton and Boxboro, Mass., specimens a specialty, including lilac scapolite, scapolite crystals, nuttallite, chiascolite, and a great many others. Collectors send lists. G. L. BRIGHAM, Bolton, Mass.

I will exchange 5 and 10 cent specimens of calcite (2 var.), chalcedony (2 var.), feldspar (2 var.), honeycomb coral (2 var.), augite, quartz, red and gray sandstone, and five var. of fossils, for U. S. or foreign coins in good condition. I also have a good single-barrel shot-gun, with powder-flask and shot-pouch, worth \$4, which I will exchange for coins, a 22 rifle, or will sell cheap. Send offers. E. E. SMITH, Trenton, Iowa.

I have a Ballard 88 caliber rifle and belt, a Wesson 22 caliber, 12-inch barrel pocket-rifle, a .32 caliber revolver, a nickel hoop 16-bracket banjo and instruction book, a cocoa-wood German-silver ferules and key flageolet and instruction book to exchange for a 50-inch wheel bicycle, or any of the following articles: flute, field-glass, microscope, 32 caliber rifle, or Smith & Wesson revolver. Also minerals, fossils, and shells for same. Indian relics or books that treat of them. JOHN G. BUXTON, Milo Center, Yates County, New York.

❖Archæology❖

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

SNAKE AND SNAKE-LIKE MOUNDS IN MINNESOTA.

By T. H. LEWIS.

PART I.

From time immemorial certain mythical or superstitious interest has attached itself to the serpent—the wisest of the beasts of the field—amongst most nations, whether civilized or barbarous, and his pictured or sculptured delineations have been the occasion for much writing on the part of antiquarians.

In North America the creature has been depicted by the ancient inhabitants in various ways; as, for instance, by carving on rocks, by outline arrangements of stones or boulders placed on the ground, and, more sparingly, by mounds of earth. The latter belong to the class of earth-works known as “effigies” of which the “Great Serpent” of Adams County, O., stands an unequalled representative. Indeed, with the exception of this one, no mounds representing snakes have hitherto been delineated and published, except one or two somewhat dubious specimens in Wisconsin.

In the course of my surveys in Minnesota, I have met with at least two such effigy-mounds, which, with some others looking suspiciously like tadpoles, I have numbered and described as follows:

No 1 is situated on the west side of St. Croix Lake, on the town-site of Afton, Washington County. The land here slopes toward the lake, and the attlesnake lies just above high-water mark. The head is $5\frac{1}{2}$ feet high, 88 feet long, and 56 feet wide at the broadest point, which is also the highest, from which it gradually descends to the body. Where the head joins the body the embankment is 22 feet wide and nearly $2\frac{1}{2}$ feet high. The body is but slightly curved. In the next 160 feet the

width increases to 26 feet, but the height drops to 2 feet. From this point it gradually diminishes to 18 feet in width and 1 foot in height. Connected with the extremity or tail, there are three small mounds whose bases inter-lock, thus forming the rattles. The last of these mounds is 20 feet long and 18 feet wide, and the two between it and the tail are each 18 feet in diameter, and all three are of the same height as the end of the tail. The total length of this effigy is 534 feet. On June 25, 1883, when this survey was made, in addition to the snake, there were four round mounds and one embankment in the group. Formerly there were other mounds, but they had been demolished.

[TO BE CONTINUED.]

A Necklace of Human Fingers.

A RELIC of Indian barbarism was received at the War Department a few days ago. It consisted of a necklace of human fingers. Originally there were eleven fingers, strung together after the manner of necklaces of bear's claws, but three of them had been lost. This ghastly adornment was captured in an attack on the Northern Cheyennes in 1876, and each finger represented a life taken by the owner, the “big medicine man” of the tribe. The fingers had been preserved by opening the skin, removing the bones, scraping away all the tissues and fatty substances, replacing the bones, and subjecting the skin to some tanning process. The necklace was sent to West Point by Captain Bourke, who is now engaged in preparing some historical matter relating to the Indians. It was brought from West Point here in order that it might be reproduced in papier-mache at the Smithsonian Institution.

It is asserted that the average length of life is constantly increasing, and the time may yet come when persons a hundred years old will excite no more curiosity than one of eighty years at the present time.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERLAIN.

PART XI.

HENRY GETS BACK—WE PAY A LAST VISIT TO THE FARM—AND FOOL WITH THE BULL WITH AN ALMOST DISASTROUS RESULT.

OF course this aroused the whole house, and everybody stuck their head out of the door to see what was up. He explained the circumstances to the farmer and made immediately for his room, looking as sheepish as a whipped boy, followed by our laughter.

This incident woke us up so thoroughly that we got very little sleep afterwards and were soon up enjoying the fresh morning air.

Henry did not make his appearance until nearly ten o'clock. He said he was glad our visit was nearly over, because as soon as this incident got around town he would be pointed out as a natural curiosity. After breakfast we went to the barn to pack up what specimens we had secured since we sent off the other lot of boxes. We found an immense amount of specimens which had accumulated, and wondered what we would do with them all. However some of us set to work hunting up boxes, others paper and cotton, and others sorting as much as possible the different specimens, laying aside any that were likely to get hurt during transportation.

We had a hard job raising boxes enough to pack them in, as we had already pretty nearly cleaned out the farmer. We had to end up by making a couple of boxes out of some old boards we found in the barn.

This job occupied our attention all the morning and we felt quite tired by the time we were through. We now packed them on the wagon ready for an early start in the morning.

We now had dinner, after which we

went out on the shady lawn and laid down to rest.

At four o'clock, as the heat was then abating a little, we started on a last tour of the farm.

First we visited the cultivated portions and had a roll in the new-mown hay, ending up by burying one of our number in the stack and laughing at him work his way out, only to cover him, again as soon as his head appeared, with a fresh lot of hay.

The next place we visited was the water-melon patch, where we got away with a couple of the farmer's best melons.

We made a raid next on his berry-patch, and although there was now only blackberries left, they were of the big Lawton kind, and we sampled them quite extensively.

Next we made for the orchard, where we made the apples and pears and peaches disappear as though we hadn't eaten anything all day.

After staying here an hour, Paul said: "Let's pay a visit to the bull." So we all started down to see his Lordship. He was quietly grazing at one end of his enclosure. We asked Paul if he didn't want to try a race across the lot. He said he didn't mind if the rest would take their chances with him. But some of the rest did not care about running the chance of getting tossed.

We determined to have a little fun with the bull anyway and amused ourselves by going a short way into the pasture and then running back as soon as the bull started for us. Each time we would go a little nearer, each seeing which dared go the nearest.

By the time we started in the fourth time he was fully aroused and made for us like "greased lightning." When he reached the fence instead of stopping as he had done before, he cleared it at one leap.

To see the way we scattered was a caution. Some of the poorest runners had amused themselves by sitting on the grass and watching us. But the way they scrambled up and made for the nearest fence was laughable to behold.

[TO BE CONTINUED.]

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year.....\$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch......50

Per Column.....2.75

Per Page.....5.00

Liberal discount on standing ads.

Nothing less than a half-inch ad. taken.

Advertisements must be in by the 20th, and exchanges by the 15th of the month to insure insertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

WE return thanks for a copy of the "Tag Collectors of the World" sent us. It is published by F. L. Willcutt, Cleveland, O. Price 5 cents.

AMONG the relics found in the high mound, on the Ohio River, opposite Portsmouth, Ohio, were two crosses and thirty buckles of silver. The crosses were decorated with leaves, but furnished no clew as to their date; but one of the buckles, which was heart-shaped, bore the French crown of 1730 or 1740. The whole outfit probably belonged to a convent of one of the Jesuit missionaries. The discovery indicates that the mound was used for burials down to quite recent times.

Oregon's Deepest Lake.

A PARTY sent out by the U. S. Geological Survey, under command of Captain Clarence E. Dutton, United States Army, has succeeded in reaching and making a complete survey of Crater Lake, in Oregon, a body of water whose shores, with the possible exception of one point on the south, have never before been touched by the feet of white men.

The party's boats were hauled a hundred miles by mule teams, dragged by a detail of soldiers up the snow-clad sides of the ridge which surrounds the lake and lowered by ropes from the crest to the water, 900 feet below. One hundred and sixty soundings were made, the result of which gave the general character of the lake bottom. Two large submerged cinder-cones were found, respectively 800 and 1200 feet high, the rest of the bottom being flat. Captain Dutton believes this to be the deepest body of fresh water on the continent. The greatest depth attained by the sounding line was 2005 feet.

Queer Way to Grow Rich.

A CHICAGO paper has the following: "John T. Jones, who a few months ago was working as a day laborer, is now independently wealthy. His fortune was acquired in a most singular manner. When he first came here he worked about different mines for awhile, but finally offered twenty-five cents a ton for a pile of rocks at the Winthrop Hematite Company's mines, the money to be paid as the rock was removed. He also bought other piles of rock at the same price. The company was surprised one day when Jones set a force of men at work sorting the rock and carting off the ore. It now transpires that the rock pans out about one-half good ore, for which Jones received \$5.50 a ton. The Winthrop pile alone netted him nearly \$1,000,000. The work has been conducted under the very eyes of the mill-owners, who have regarded the rock piles as worthless, and paid no attention to Jones. The ore has been largely shipped to Joliet. He can buy no more rock piles, and the owners are going about in large numbers, sampling the heaps of refuse which dot the mining fields.

KEEP a sharp lookout for the first number of the Third Volume. A number of interesting articles has already been secured for it.

MINERALS OF TULARE COUNTY, CAL.

A REMARKABLE FIELD FOR THE MINER AND COLLECTOR.

BUT few people have a proper conception of the mineral resources of Tulare County, Cal. It is doubtful if there is another locality in the United States where such an abundance and such a variety of minerals occur. Gold and silver are found on White River, Mill Creek, Deer Creek, at Mineral King and about fifteen miles east of Visalia near the ranch of Wm. Mehrrens. Copper is found on Deer Creek, and rich deposits of this metal have recently been discovered about twelve miles east of Camp Badger. Fine marble and gypsum are found about eighteen miles northeast of Supervisor Barton's ranch, on the Kaweah, and near Mr. Elam's place in Drum Valley occurs large deposits of graphite, or plumbago. In the same locality talc is found in abundance. Gold has been discovered in Frazier Valley, and near the ranch of John Tuohy on Lewis Creek a fine quality of serpentine and picrolite occur. Not very far from Mr. Tuohy's house a superior quality of semi-opal has been discovered, and further up on the Yokohl rose quartz exists. On Lower Tule River large deposits of calcite, barite, feldspar, and satinspar occur, and in the same locality strontianite, which is used in the manufacture of fireworks, has been discovered. Near Three Rivers are found large deposits of limestone, which is far superior to the Santa Cruz limestone. A lime kiln was successfully operated for a number of years at this place, on the lands of Mr. E. Jacob. In the same locality manganese, containing small scales of micaceous iron, may be found. In Drum Valley iron ore exists in large quantities, and fine granite is also found there.

Besides the useful minerals enumerated, there are found in Tulare County minerals of great interest to the collector and scientist.

At Stokes Mountain, twelve miles north of Visalia, some fine black tourmaline crystals occur imbedded in white quartz, and northeast of here is found fine topazolite

garnets, combined with calcite, azurite, malachite, and erubescite.

Of other specimens found there may be mentioned chrysocolla on garnet.

On Upper Tule River fine crystals of feldspar (orthoclase) covered with quartz crystals, and crystals of mica are found.

Near Three Rivers fine lime-iron garnets with magnesia (apophane) occur, and in the same locality fine specimens of radiated talc may be had.

At the Palmer cave and Clough's cave, about thirty miles east of Visalia, very fine stalagmites and stalactites occur, and on the Mineral King road choice specimens of calcareous tufa are found. In the same locality fine crystals of epidote, asbestos, and actinolite occur, the latter in dark crystals and in asbestiform.

The scientist who makes fossils and Indian relics his special study, will find Tulare County a rich field for his labors. The remains of antediluvian animals have been found near White River, and farther south, near the Kern County line, the country is rich in fossil shells.

On the western shore of Tulare Lake, probably the most extensive field of fossils in California exists, there being many varieties of the lower Silurian period.

At Antelope Valley and Three Rivers may be found many relics of the stone age, such as Indian mortars, pestles, spearheads, and arrow-points.

This is but a brief account of what is found in this county in the way of minerals. It is predicted that in the near future the county will astonish the world with its mining discoveries.—TULARE CO. TIMES, CALIFORNIA.



FINDING A DIAMOND OF GREAT BRILLIANCY.
—J. S. Keyser, of Ponca, Neb., while sinking a shaft for coal immediately north of the town a short time ago, discovered a stone of rare brilliancy weighing three half ounces. It was taken to Sioux City where it was examined by a number of jewellers and pronounced to be a diamond of good quality. The find has produced the wildest excitement at Ponca.

NEW YORK MINERALOGICAL CLUB.

THE eleventh meeting of the Club was to have been an outdoor meeting at Weehawken, but a new locality having been discovered by Mr. Niven, at Fort George, New York City, the meeting place was changed to there, and the date fixed for the meeting was the 23d of July, at 2 o'clock.

As ill luck would have it, it rained almost all the afternoon, so that only three went to Fort George, and the rain prevented them from getting much.

A special meeting of the Club was held at the residence of Prof. D. S. Martin, 236 W. 4th St., on July 28th, to devise means as to how best to be represented at the meetings of the American Association for the Advancement of Science. It was decided to form two loan collections from the cabinets of the members, one to represent New York Island and the other the immediate vicinity, and to place them in the room set aside for Geology section at Columbia College. A committee of five was appointed to receive and arrange the collections. After hearing some interesting facts about Mr. Kunz's trip in Kentucky and other places, the meeting adjourned.

Is there a Diamond Field in Kentucky?

By J. S. DILLER and GEO. F. KUNZ.

[Extract from a paper read before the American Association for the Advancement of Science]

THE great similarity of the peridotite of Elliot County, Ky., to that of the South African diamond fields has attracted considerable attention, and hundreds of prospectors, moved by "interesting probabilities," have visited the region in search of gems and precious metals. In May, 1885, when the peridotite of Kentucky was studied in the field, the character of the diamond-bearing rock in South Africa was not yet fully understood and consequently no search was made at the time for diamonds. Recent developments, however, rendered it

desirable that they should be intelligently sought for, and on the invitation of Mr. J. R. Proctor, the State Geologist of Kentucky, we were sent by Major J. W. Powell, the director of the United States Geological Survey, to make the investigation.

Our plan was to search by sifting and carefully panning the stream beds, receiving the drainage directly from the surface of the peridotite, and to enlist the services of the people in the neighborhood to scrutinize the steep slopes where gems weathered out of the peridotite might be exposed. Particular attention was directed also to the examination of the solid rock and residuary deposits which so closely resemble the diamantiferous material of the South African mines.

During a careful search over a small area for nearly two days, no diamonds were found; but this by no means demonstrates that diamonds may not yet be discovered there. The remarkable similarity between the peridotite of Kentucky and that of the Kimberly and other diamond mines of South Africa is very striking; and when this alone is considered, the probability of finding diamonds in Kentucky seems correspondingly great; but when we reflect that the carbonaceous shale and not the peridotite itself is the source of the carbon out of which the diamond is formed, and that the shale in Kentucky is much poorer in carbon than that of the South African mines, the probability of finding diamonds there is proportionally diminished.

Saving the Small Pieces:

A GERMAN chemist and metallurgist, Dr. Kesmann, strongly recommends the use of treacle for forming small coal and fire ore into solid briquettes, as first proposed by Sultery. A mixture of 1 to 1½ per cent. of treacle was sufficient to make coal dust of very lean Silesian coal into good solid blocks which gave a strong coke. Such blocks are also excellent for gas-making. In a similar manner blocks can be made of powdery iron ore, such as some magnetic ores and pyrites residues.

MINERALS

WE HAVE A LARGE STOCK OF FINE CABINET SPECIMENS OF MINERALS, AND ARE PREPARED TO FILL ORDERS FOR SINGLE SPECIMENS OR ILLUSTRATIVE COLLECTIONS OF ANY KIND, AT VERY REASONABLE FIGURES. WE INVITE ESPECIAL ATTENTION TO OUR FINE CRYSTALLIZED

WULFENITE, MALACHITE, AZURITE,
 VANADINITE, DESCLOIZITE, MILLERITE,
 SPHALERITE, STIBNITE, ZIRCON.

ALSO TO OUR MALACHITE ROOTS AND PSEUDOMORPHS AFTER AZURITE; GREENOCKITE COATINGS; IRRIDESCENT, CRYSTALLIZED CHALCOPYRITE, VELVET CHALCODYTE, BLUE AND ORANGE CALCITE, ACTINOLITE.

WE HAVE A MOST COMPLETE STOCK OF FRANKLIN MINERALS, INCLUDING PERFECT SPECIMENS OF DYSLUTE, FOWLERITE, FRANKLINITE, GREEN TOURMALINE, CRYSTALLINE ZINCITE, TROOSTITE, AMAZON STONE (RECENTLY DISCOVERED), CALAMINE, CHALCOPHANITE, HETTEROLITE, AND GARNET.

Minerals for Commercial and Technical Purposes A SPECIALTY.

ORDERS PROMPTLY FILLED. CORRESPONDENCE SOLICITED. TERMS CASH. GIVE US A TRIAL.

GEO. L. ENGLISH & CO.,
 DEALERS IN MINERALS,
 1512 CHESTNUT ST., PHILADELPHIA, PA.

TAG COLLECTORS.

All my tags are unused, rare and genuine. I deal in no other. Each of the below boxes contain 50 all different tin tobacco tags, and each box is different from the other.

| | |
|---------------|---------------|
| Box A, - 12c. | Box D, - 12c. |
| " B, - 12c. | " E, - 12c. |
| " C, - 12c. | " F, - 12c. |

The above 6 boxes (300 different tin tags) for 60 cents. All tags sent post-paid.

Send stamp for price-list, etc. Remit by postal-note or silver. Address,

HARRY B. WILBER,
14 Main St., Cambridgeboro, Pa.

THE ARIZONA MINERAL COLLECTION.

PUT UP BY

MR. WILLIAM NIVEN,

Late Assistant-Commissioner, Arizona Territory,
World's Fair, New Orleans

ONLY 50 CENTS A BOX.

This is the most attractive collection that has yet been put in the market, and should meet with a large sale. It consists of 12 specimens packed in cotton in a partitioned box each accompanied by a printed list giving name of mineral, composition, etc., together with an engraving of the Natural Bridge, Chalcedony Park, Arizona Territory, which is made entirely of the wood of which this collection contains a piece. Each box contains:

FLUORITE,

FREE GOLD,

CHALCOCTTE,

MALACHITE,

CHALCOPYRITE,

SMOKY QUARTZ,

NATIVE COPPER,

JASPERIZED WOOD,

AZURITE CRYSTALS,

CUPRITE ON LIMONITE,

ARGENTIFEROUS GALENA,

ARGENTIFEROUS QUARTZ

For sale by

A. CHAMBERLAIN,

284 Pavonia Ave., Jersey City, N. J.

25c. Will buy one bleeding tooth shell, five red sea beans, and 20 varieties of U. S. Revenue and Postage Stamps. Specimen copy of The Old Curiosity Shop, six cents. WILL M. CLEMENS, Jamestown, N. Y.

The Youth's Leisure Hour

is a 12 page monthly magazine, devoted to literature, natural history, collecting, etc. We give big PRIZES monthly. Subscription 35 cts. per annum. Advertising rates low. F. C. JOHNSON, Boonville, N. Y.

JUST RECEIVED.

A lot of Herkimer County Double-Terminated Quartz Crystals, which I can sell at 2½, 5, 10, 15, 20, 25, 35, and 50 cents each. These are the finest quartz crystals found in this country, and any collection not having some of them is not only incomplete but is without its most attractive specimen. One dozen lots 10 per cent. off.

A. CHAMBERLAIN,

284 PAVONIA AVE., JERSEY CITY, N. J.

52 Page Song Book. contains some of the most popular song of the day, will be sent free on receipt of a 2-cent stamp L. R. TONEY, Publisher, Richmond, Ind

U. S. LOCAL STAMPS.

Rare old Hussey's, Boyd's, Grafflin's, etc., Local Despatch Stamps at nearly (½) half catalogue prices. All warranted *Genuine Originals*. Sheets of locals sent on approval. Good commission. Reference required.

20 var. original locals, 65c

150 asst. original locals, for dealers, \$1.50.

Send for price-list.

F. N. MASSOTH, Jr.,

Hanover Center, Indiana.

THE Exchangers' Monthly

DEVOTED TO

**MINERALOGY,
ARCHÆOLOGY,
GEOLOGY.**

Sample copies free. Exchange columns free to everyone. Advertising rates on application. Address,

THOS. CHAMBERLAIN,

284 Pavonia Ave., Jersey City.

Publishers desiring to insert the above 2-inch advertisement for 3, 6, or 12 insertions, and receive same space in THE EXCHANGERS' MONTHLY, will please send copy of their "ad." and I will send an electrotype of the above "ad."

VOL. II.

NO. 12.

OCTOBER, 1887.

THE

Price, 3 cents.

25 cents a year.

EXCHANGERS

MONTHLY

DEVOTED TO

Mineralogy, Geology, and Archæology.

CONTENTS

| | |
|---|----|
| GIGANTIC JADEITE VOTIVE ALZES FROM OAXACA, - - - | 89 |
| ROCK CRYSTAL FROM ASHE CO., N. C., - - - | 90 |
| A TRIP TO THE FRANKLIN-STERLING ZINC MINES, - - - | 91 |
| STRENGTH OF GRANITE, - - - | 91 |
| EDITORIALS, - - - | 92 |
| JASPERIZED AND AGATIZED WOODS OF ARIZONA, - - - | 92 |
| EXCHANGES, - - - | 93 |
| SNAKE AND SNAKE-LIKE MOUNDS IN MINNESOTA, - - - | 94 |
| REMARKABLE CRYSTAL SKULL, - - - | 95 |
| NEW YORK MINERALOGICAL CLUB, - - - | 88 |
| A SAMPLE MILLIONAIRE, - - - | 96 |
| ORIGIN OF PETROLEUM, - i - - - | 96 |

Published by THOS. CHAMBERLAIN, JR., Jersey City, N. J.



Advertisements.

When answering advertisements found in this paper, please do us a favor by mentioning THE EXCHANGERS' MONTHLY. Advertisements must be in by the 20th of the month to insure insertion in next number.



POST NO BILLS
A DESIGN FOR
AN ADVERTISEMENT

ELECTROTYPE
of this Design, with any wording, by mail, \$1.30.
Address NEWS-LETTER,
Corona, New Jersey.

Other Designs and Samples of Printing given in the NEWS-LETTER. Orders for Electros, cash or C. O. D.

WM. NIYEN,
DEALER IN
FINE MINERAL SPECIMENS
AND
OBJECTS OF ART AND GENERAL USE
MADE FROM
JASPERIZED WOOD, LABRADORITE,
CROCIDOLITE, CARNELIAN, MOSS
AGATE, MALACHITE, ONYX,
RHODONITE, Etc., Etc.

A SPECIALTY MADE OF
JAPANESE CRYSTAL BALLS
OF ALL SIZES.
739 BROADWAY, NEW YORK.

A SAMPLE SELF-INKING STAMP
which will print your name, or name, business, and address, also 25 visiting cards, large catalogue, etc., all mailed free for 50 cts. (stamps) to all who will be agents.

Model Rubber Stamp Co., Baltimore, Md.

THE STAR ADVOCATE

A MONTHLY JOURNAL

Devoted to the Interests of STAR RIDERS and Cyclists in General.

E. H. CORSON, Editor and Proprietor.

TERMS, 50 Cents a Year, in Advance.

Address all communications to **THE STAR ADVOCATE, East Rochester, N. H.**

Make Money Orders and Drafts payable to E. H. CORSON.

We can promise an interesting and instructive paper for all cyclists. Send for a sample copy.

STAMP COLLECTORS!

Send 3 c. stamp, and a promise to return in 10 days, and receive an A1 approval sheet of genuine stamps. Address, SCHAFINO & CO., P. O. Box 74, Guadalajara, Mexico.

BEAUTIFUL CRYSTALS!

For \$1 I will send by mail 25 of the celebrated

DOUBLY TERMINATED QUARTZ CRYSTALS,

found only in this locality. They are remarkably brilliant and the finest found in the U. S. No collection complete without them. Satisfaction guaranteed.

A. B. CHIM,
Middleville, Herkimer Co., N. Y.

SPORTSMAN'S

Knife, two blades with cork-screw, screw-driver, and hoof-cleaner stag or bone handle, valued at \$1, will be given free for only two subscribers to THE LITERARY VISITOR, at 25 cents each, and 10 cents extra for postage on the knife. L. R. TONEY, Richmond, Ind.

FOR THE BOYS.

Lovely Favorites have been Photographed from life in the most bewitching and enchanting manner, and expressly for us. We will send 12 for 25 cents and give you THE LITERARY VISITOR one year free. L. R. TONEY, Richmond, Ind.

MONEY

made easy Manufacturing Rubber Stamps. Send for Price List of Outfits, to J. F. W. Dorman, No. 217 East German Street, Baltimore, Maryland, U. S. A.

THE EXCHANGERS' MONTHLY

(Entered at the Post Office of Jersey City, N. J., as Second Class Matter.)

VOL. II.

JERSEY CITY, N. J., OCTOBER, 1887.

NO. 12.

GIGANTIC JADEITE VOTIVE ADZE FROM OAXACA.

By GEORGE F. KUNZ.

[Read at the New York Meeting of the American Association for the Advancement of Science, August 1., 1887.]

This jadeite adze of Mexican origin is, as far as the writer has been able to ascertain, the largest yet found, and is notable not only for its great size, but also for its peculiar character and the excellence of the working in so hard a material. It is said to have been found about twenty years ago in Oaxaca, Mexico. It measures 272 mm. (10 $\frac{1}{2}$ inches) in length, 153 mm. (6 inches) in width, and 118 mm. (4 $\frac{1}{2}$ inches) in thickness, and it weighs 229.3 ounces troy. Across the ears 153 mm. (6 inches), across the lower axe end 82 mm. (3 $\frac{1}{4}$ inches), height of head to neck 158 mm. (6 $\frac{1}{4}$ inches), height from chin to foot 115 mm. (4 $\frac{1}{2}$ inches), and the legs 50 mm. (2 inches) wide. The color is a light grayish green, with streaks of an almost emerald green on the back. In style of ornamentation it very closely resembles a gigantic adze of granite 57 cm. long and 34 cm. wide mentioned by A. Chavers in "Mexico d: travis d. Los Siglas," 1886, p. 64, and has almost an identical counterpart in the aventurine quartz adze now forming part of the Christy collection at the British Museum, and formerly in the possession of Mr. Percy Doyle of the English Diplomatic Service; differing from these two objects, however, in having no ornamentation on

the forehead, and having in addition four dull markings on each ear, one under each eye, and one near each hand, which seemingly could have served no other purpose than to hold thin plates or films of gold, which the polished surfaces would not do. Of the gold used here no trace can at present be seen.

From all appearances, this adze is the result of the shaping of a boulder, since weathered surfaces would only be found on a fragment that had been exposed. The lapidarian work on this piece is probably equal to anything that has ever been found, and the polish is as fine as that produced by modern man.

Of additional interest is the fact, that, although this adze is undoubtedly one of the finest objects which these Aztecs or Maya possessed, yet they desired to "extend" the material, as it may be termed, as has been described by Dr. J. J. Valentine in the American Antiquarian Society as to the origin of the Leyden plate, April 27, 1878, p. 11, and more recently by Prof. F. W. Putnam in his paper before the American Antiquarian Society, new series, vol. 5, April, 1886, on the Central American Celts, showing how these had been cut, not only into two, but four pieces.

There have been two fully successful and one partly successful attempts to remove pieces from this object, evidently for the purpose of making other objects (the supply of material being exhausted), to bury a part with some dead chief, and possibly from the wish to bestow on new branches

of the same tribe portions of a material which they held as sacred. Enough has been cut from the back of the object to equal one-eighth of the entire weight, and the manner in which the material they used in cutting it was held has produced a rounded cut on each opposite side from where the cutting was done, lending credence to the theory that some abrasive was used, such as sand or sapphire, by means of a string held in the hands or stretched across a bow. In the "American Journal of Science" for July, 1882, the writer has described a sapphire pebble found in a brook in Oaxaca, almost equal to that from Ceylon. If they knew of the existence of this sapphire, we can more readily understand how they worked so large a mass of tough and hard material. The material is jadeite; it is in the Mohs scale of hardness.

So far as the writer has been able to ascertain, no similar object of equal magnitude and archaeological interest exists. The Humboldt celt, the Leyden plate, the Vienna adze, and the one in the Ethnological Museum at Dresden, which weighs only seven pounds, and is entirely devoid of ornamentation, can scarcely compare with this.

(This paper will be published in full by the Bureau of Ethnology, and the adze will be figured in color and natural size. During the discussion at the meeting it was agreed by all present that this was the finest aboriginal jadeite object known to them.)



ROCK CRYSTAL FROM ASHE CO., N. C.

By GEORGE F. KUNZ

[Read at the New York Meeting of the American Association for the Advancement of Science, Aug. 12th, 1887.]

At the last meeting of the association I presented a paper on the occurrence of rock crystal in what I was then informed was a part of Virginia, but which, on visiting the locality, I found to be really the mountainous part of Ashe Co., N. C.

My attention was first called to this local-

ity by the sending from there to Messrs. Tiffany & Co., of a 50-pound fragment of a large crystal, which was said to have been broken from a mass weighing 300 pounds by a twelve-year-old mountain girl. This large crystal had been found on the Minton Blevin Farm, on the Long Shoal Creek in Chestnut Hill Township, though crystals had also been found at two places 600 feet apart, on the L. C. Gentry Farm, about one mile from the former locality all three places being fifty miles from Abingdon, Va., and forty from Marion, Va., and also close to the north fork of Pliny Creek, on the St. Leger Brooks Farm. At the latter place was found a remarkably clear 20½-pound distorted crystal, which is herewith exhibited, and is absolutely perfect, and is the finest piece of rock crystal that has been found in the United States; and on another crystal weighing 285 pounds, that was 29 inches long, 18 inches wide, and 13 inches thick, showing one pyramidal termination, entirely perfect and another partly so.

All these localities are on a spur of the Phoenix Mountain, and the crystals have all been found in decomposed crystalline rocks, principally consisting of coarse feldspathic granite, which has all entirely decomposed, even to a greater depth than these crystals occur in. Most of them are obtained either by digging where one crystal is found, or by driving a plough until some hard object is struck. Altogether some dozen crystals have been found weighing from 20 to 300 pounds each, and undoubtedly future workings will bring many fine ones to light.

Some of these crystals afford larger masses of clear rock crystal than have ever been found in the United States, and suggest its use for such objects of luxury as crystal balls, clock cases, mirrors, etc., which are now to be seen in the Austrian Treasury at Vienna.



Less than one-third of the earth and debris that cover the ruins of Pompeii have yet been removed.

A TRIP TO THE FRANKLIN-STERLING ZINC MINES.

By ARTHUR CHAMBERTAIN.

PART XII.

CONCLUSION.

THE moment the bull cleared the fence he made for the nearest person to him, but we had such a start on him that we easily reached the other fence before he could catch us. However we didn't fool with him any more that day.

We now heard the supper bell ringing, so we started for the house. The supper was all that we could wish, but we had eaten so much fruit that we did not appreciate it.

After supper we had a service of song, the young lady playing on the organ and all of us singing Moody & Sankey and other hymns to the best of our ability. By this means we passed our last evening very pleasantly and we were all sorry when it was time to retire.

By five o'clock in the morning we were all out of bed and were soon at work packing up our duds ready to start, as we wished to take the 6:30 train for Jersey City.

A splendid breakfast awaited us when we got through, to which we did justice, and by 6 o'clock we were ready to start for the train.

The farmer had packed us up several boxes of peaches, pears, and apples, and these he put on the wagon with the minerals and started his man with it for the depot he and his daughter accompanying us on foot.

When we came to part it seemed as though we were leaving friends we had known for years. The old farm house itself had become like home to us we had had such good times in it.

There was two persons who seemed to hate the parting more than the rest. One was the young lady and the other was—well I won't mention any names, if my readers are not sharp enough to guess they

will have to get along without knowing. They looked as though the world was soon coming to an end. I heard each of them say to the other about a dozen times in going down to the train: "Now you will be sure and write and let me know how you are getting along."

The depot was soon reached, and as the train was on time we were soon aboard and waving our adieus to the farmer and his daughter, as we sped on our way to Jersey City. I tried to cheer up our gloomy member as much as possible, but was only partly successful.

We all felt sorry that our trip was over and that we must settle down to work once more. But each voted it a grand success, and before we left the train we made arrangements for sending the farmer and his family a fitting testimonial of our regard for the many kindnesses and favors he had shown us while there.

The ride back was uneventful, the train reaching Jersey City about 10 A.M. We made arrangements to have our boxes taken to the house of one of our members. We also arranged a night when we would meet and divide our specimens.

The trip was now ended and so is my story. If the readers of the MONTHLY have derived half the pleasure in reading of the trip that I did in participating in it, then my efforts have not been in vain and I can say

AU REVOIR.

Strength of Granite.

COMPARATIVE tests of the granites of New England and Minnesota have been made with a view to determine their crushing strength. The pieces employed were two-inch cubes unpolished, and, crushed between wooden cushions, the average strength of twenty specimens of Minnesota granite was found to be 93,272 lbs., or 23,318 lbs. per square inch; crushed between steel plates, the average strength was 104,800 lbs. or 26,200 lbs. to the square inch of surface. The average of New England granite was 59,785 lbs., or 14,756 lbs. per square inch.

THE Exchangers' Monthly.

PUBLISHED BY

Thos. Chamberlain, Jr.

TERMS.

1 Year..... \$.25

ADVERTISING RATES.

Per Half Inch.....\$.25

Per Inch..... .50

Per Column..... 2.75

Per Page..... 5.00

Liberal discount on standing ads.

Nothing less than a half-inch ad. taken.

Advertisements must be in by the 20th, and exchanges by the 15th of the month to insure insertion in next number.

Address all communications to

THOS. CHAMBERLAIN, JR.,

284 PAVONIA AVE.,

JERSEY CITY, N. J.

THE meeting of the American Association for the Advancement of Science was held at Columbia College from Aug. 10th to 16th and was very successful. We devote almost our entire space this month to papers read before the Geology branch and trust all of our readers will find them interesting. The New York Mineralogical Club was represented by two cabinets made up from the private collections of its members. One consisted of New York City minerals and the other minerals from its immediate vicinity. Both cabinets drew a good deal of attention and were pronounced fine.

MR. CHARLES S. MASON, late of Easton, Pa., has changed his residence, having moved to Canfield, Mahoning County, Ohio, where he has taken charge of the Natural History Department of a Normal College. He is, however, contemplating another change.

WITH this number we finish our second volume and are still alive and kicking. During the past year a great many amateur papers have gone under, the most important being "The Hoosier Naturalist."

Jasperized and Agatized Woods of Arizona.

By GEORGE F. KUNZ.

[Read at the New York Meeting of the American Association for the Advancement of Science, August 16th, 1887.

IN the March (1886) number of the "Popular Science Monthly" (this also appeared in the EXCHANGERS' MONTHLY, Vol. I, Nos. 6-8), the writer described the jasperized and agatized wood of Arizona, and called attention to the magnificent colors and the remarkably large sections of trees, which, to all appearances, would furnish art objects such as had never been seen before, and it was suggested that possibly perfect sections could be produced from two to three feet in diameter. Until very recently, however, it has seemed as if, although the material might exist, it would be impossible to have art so assist nature as to show all its beauties.

After many attempts both here and abroad, the task of polishing such large sections was about given up; but recently American ingenuity and perseverance have at last conquered this hard material, and we have here to-day the finest sections of silicified trees that have ever been seen—finest not only for their beauty of coloring and polish, but also for their extra large size.

The following objects were on exhibition:

One column cut transversely across the tree, so that the heart was visible on two sides of the column, the rings radiating from it in all directions. It is $11\frac{1}{4}$ inches wide and 21 inches high, and is a most remarkable piece of lapidary work.

Five sections measuring 25, $19\frac{1}{2}$, 24, $17\frac{1}{2}$, and 13 inches respectively in diameter, with such a high polish that when turned with the back toward the light a perfect mirror was formed.

The color of all was unsurpassed. They were cut by a gang of seven saws and polished on wheels 14 feet in diameter, at Sioux Falls, Dakota, the power being furnished by water from the falls.

✧ Exchanges ✧

These columns are free to all, but subscribers will be given the preference. All exchanges must be in by the 15th of the month to insure insertion in next number.

Five minerals for the same. Send lists. S. MERACH, JR., 213 Grand Avenue, Brooklyn, N. Y.

200 U. S. coins and 50 varieties of minerals for fossils, minerals, Indian relics, or quartz crystals. A. E. HAMMOND, Willimantic, Conn.

Will exchange Acme printing press, 2 fonts type and roller, for best offer in scrap pictures. JAMES L. FOX, Box 261, Tom's River, N. J.

V-nickels without the word cents to exchange for minerals, and also good minerals to exchange for the same. JAMES P. BATH, Box 517, Willimantic, Conn.

Three foreign coins or a small piece of the Obelisk in N. Y. (Egyptian syenite), for specimens. Send lists. E. G. MATHIS, 294 Pavonia Avenue, Jersey City, N. J.

Three curiosity papers for 50 square cut envelope stamps, 15 entire postals, 100 square cut postmarks, or 50 var. foreign stamps. C. HADDAWAY, Easton, Md.

I have over sixty varieties of fine minerals to exchange for others of equal value. Send your list and receive mine in return. N. W. STARBIRD, JR., Danvers, Mass.

Good books, fossils, minerals, coins, a nearly new photo camera, adv. space in "The Youth's Leisure Hour," etc., for good second-hand wood cuts or electrotypes. F. C. JOHNSON, Boonville, N. Y.

I will give 10 different amateur papers for every 100 mixed U. S. or foreign stamps sent me, 10 different for every 100 square cut postmarks, and 10 different for every 50 tin-tags. W. E. BILLINGS, No. Leominster, Mass.

A No 2 International Postage Stamp Album containing 579 var. of stamps and 200 mixed foreign stamps for a tag collection of not less than 1500 varieties. HARRY B. WILBER, 14 Main St., Cambridgeboro, Pa.

Would like to exchange fine minerals for the following: alunite, aluminite, argentite, atacamite, chalcocite, cassiterite, licorite, etc. List of duplicates on application. E. R. LARNEY, 50 24th St., Chicago, Ill.

Actinolite, alabaster, Iceland spar, cube pyrites, cube pyrites in talc, blue talc, calc spar (white, blue, and salmon), iron ore (Elba), gypsum, magnetite, calcite, mica schist, and black mica in spar, for minerals and Indian relics. W. M. GEORGE, Box 305, York, Pa.

About 100 numbers of "Youth's Companion," 60 numbers of "Golden Days," and \$5 worth of new books for second-hand printing material. C. A. MOFLEY, Rosemond, Ill.

A piece of Abraham Lincoln's log cabin, cocoa beans and mother-of-pearl, for Indian or Mound-builders' relics. Also a pair of No. 9 Acme club ice-skates, for the best offer in Indian or Mound-builders' relics. Write first. W. C. LINCOLN, 65 Clifton St., Dorchester, Mass.

I have a collection of U. S. and foreign stamps worth about \$8, for which I will take cabinet minerals and curiosities of equal value. I have also a collection of 128 different tin tobacco tags, some very rare, to exchange for curios. Have over 200 mixed tags. MAC ALEXANDER, Eastman College, Poughkeepsie, N. Y.

One doz. carnellans, one doz. porcupine quills, one doz. Ken. coffee beans, and a package of pictured rocks sent for every good 3x3 mineral sent me postpaid. Any one of above for a perfect arrowhead, a V-nickel, or 3 var. 1x1 fossils (name, locality, and formation from which taken must be given). F. A. STEARNS, 337 S. Seneca St., Wichita, Kan.

I will exchange arrow and spear points from the vicinity of Fort Ancient for fine points from Oregon, California, or the Pacific Slope. Or will exchange Lower Silurian fossils for trilobites or crinoids from other formations, or will exchange coins or stamps, foreign or U. S. revenue, or proprietary, for good Indian relics. L. SIMONTON, Lebanon, O.

I have a tiger-eye scarf-pin, nicely mounted, a rubber stamp outfit, will print any name, a gold-mounted A. T. Cross stylographic pen, a copy of Dana's Mineralogy, in good condition, and a fine cut and polished transparent gem, Ceylon moonstone, any or all of which I will give for a Sun or World Type-writer in good condition. ARON HAMBURGER, Box 1, North Wales, Pa.

Would be pleased to exchange quantities of minerals by express. Have cube pyrites, talc (red and blue) Iceland spar, calc spar (white and salmon), calcite, copper ore, alabaster, dendrites, galena, gypsum, hematite, hornblende, magnetite (Mich. and Pa.), actinolite, ochre (yellow and red), garnetiferous magnetite, and mica schist to exchange. Will also exchange by mail if desired. JAS. W. SHETTEL, York, Pa.

Wanted.—Uraninite, rutile, wulfenite, schultite, cerite, thorite, monazite, gadolinite, native tellurium, bismuth, smallite, and molybdenite, all free from gangue, for chemical purposes, in 100 lb. lots. Also matlockite and phosphenite for descloizite, iodyrite, endlicheite, guitermanite, zungite, and other rare minerals. Correspondence solicited on mineralogy as applied to the sciences and arts. THOS. S. ASH, 2052 Rush St., Philadelphia, Pa.

✧ Archaeology ✧

All articles and communications intended for this department should be addressed to ARCHÆOLOGIST, care of EXCHANGERS' MONTHLY.

SNAE AND SNAKE-LIKE MOUNDS IN MINNESOTA.

By T. H. LEWIS.

PART II.

No 2 is on the east side of Spring Creek, some three miles westward from Red Wing. It has a perceptible head, which is 8 feet wide and 1 foot high; the neck is nearly 7 feet wide and ten inches in height. From the latter point the body gradually increases its width till the middle is reached, where it is 14 feet wide and 2 feet high; thence it decreases to the end of the tail, which is 8 feet wide and 1 foot high. Its total length following the curves is 430 feet. The mound which covers the body near the head is 52 feet in length, 36 feet wide, and 5 feet in height. From general appearances it would seem that it was built after the snake was constructed; for the slope of the mound where it strikes the body of the snake is somewhat irregular, and indicates that its builders were at a loss to know how to join them symmetrically. These irregularities are not caused by the dirt washing down from the top of the mound, for otherwise it is perfectly symmetrical and the base well defined.

No. 3 is in another group of mounds about 250 yards down the same creek from the preceding one. The head is circular in form, being 40 feet in diameter and $3\frac{1}{2}$ feet high. The body at the junction with the head is 20 feet wide and $1\frac{1}{2}$ feet high, but gradually decreases to a point 97 feet distant, where it is but 14 feet wide and 1 foot high. Thence to the end of the tail it retains the latter width and height. Its total length, following the curves, is 290 feet.

No. 4 is in the same group, and lies southwest of the tail of No. 3, 35 feet. The head is circular, being 36 feet in diameter and 4 feet high. The body at the junction with

the head is 16 feet wide and $1\frac{1}{2}$ feet high. From this point it gradually decreases in width to the end of the tail, which is 12 feet wide and 1 foot high. The extreme length of this effigy is 300 feet. The heads of Nos. 3 and 4 are away from the creek. In addition to Nos. 3 and 4, there are nine small round mounds in the group.

No. 5 is in the same group with No. 2, and its head is 40 feet southeast from the head of the latter, and rests on the edge of the plateau. The head is 30 feet in diameter and 4 feet high. The body at the junction with the head is 20 feet wide and 1 foot high, and does not vary until within 20 feet of the end of the tail. From this width it gradually diminishes to 6 feet. Its total length, following the curves, is 105 feet.

No. 6 is close to No. 5, its head being only 10 feet from the end of the tail of the latter. The head differs from the others in being oblong, and is 40 feet long, 30 feet wide, and 3 feet high. About one-third of the way from the head the body forks, forming two tails of unequal length. Near the head the body is 16 feet wide and $1\frac{1}{2}$ feet high, and at the end of each of the tails 8 feet wide and 1 foot high. Its greatest length, from the extremity of the head to the tip of the longest tail is 105 feet.

The heads of Nos. 2, 5, and 6 are towards the creek, and, in addition to them, there are sixteen mounds and embankments. Both of these Spring Creek groups are on a plateau some 40 feet above the water, and were covered with brush and young timber when the survey was made (Sept. 5, 1885), but Nos. 3 and 4 are now cultivated.

No. 7 is near the south end of Lake Koronis, west of the outlet, in Meeker County. Although this mound is serpentine in form, and apparently has an open mouth, it is hard to determine exactly what it is intended to represent. The head at its widest point is 36 feet broad and $2\frac{1}{8}$ feet high. The body varies from 20 feet in width at its junction with the head, to 34 feet near the middle and 25 feet near the end of the tail, and is 2 feet high. Its greatest length, following the curve, is 167 feet. In addition to this stumpy snake there are thirty-two other mounds and embankments in the

group Directly opposite, on the east side of the outlet, there is another small group of mounds, the largest of which is nearly circular in form, and is 19 feet high. These groups were surveyed Nov. 8, 1886.

The reader fond of comparison can, if he pleases, contrast these Minnesota serpents with the Great Serpent of Ohio, by making use of the following dimensions of the latter, as measured Feb. 18, 1886: total length from tips of jaws (if closed), following the windings of the body, to the end of the convoluted tail, is 1,020 feet; length of head, about 120 feet; width of head, 80 feet. The body and tail vary in width from about 30 feet at the neck, to 8 feet at the tip of the tail, and in present height from $3\frac{1}{2}$ feet to 1 foot.

REMARKABLE CRYSTAL SKULL.

By GEORGE F. KUNZ.

[Read at the New York Meeting of the American Association for the Advancement of Science, August 12, 1887.]

THE skull which I herewith exhibit was originally brought from Mexico by a Spanish officer, before the Maximilian conquest, and sold to Mr. Evans, the English collector, at whose death it passed into the hands of Mr. E. Boban, who sold it to Messrs. Tiffany & Co. It is now in the possession of George H. Sissen, of this city, who has kindly loaned it to me for exhibition to-day.

As to its origin, little or nothing is known beyond the above facts. The inclusions of vermicules of prochlorite in the rock crystal are identical with those in the quartz in the rock crystal from Calaveras County, California. It is plain that the working of the skull is not Chinese or Japanese, or nature would have been more closely copied; and if the work were of European origin, it would undoubtedly have been more carefully finished in some minor details, which would have added more to its value. In the Californian locality large masses of crystal have been found, and from near Pachuca, in the State of Michoacan, Mexico, large pieces of rock crystal have been found, and small skulls, made of this same mate-

rial, measuring rarely more than two inches across, have often been found in Mexico. On account of these interesting facts, the writer exhibits the skull, and presents his paper, to draw out any opinions from the members of this section.

The skull weighs 5442 grams ($175\frac{1}{2}$ ounces), and it measures $8\frac{3}{16}$ inches (210 min.), $5\frac{3}{8}$ (136 min.) wide, $5\frac{1}{16}$ (148 cm.) high. The eyes, as will be observed, are very deep hollows. The line separating the upper from the lower set of teeth has evidently been produced either by a string held in the hand or possibly by a small wheel rotating on a reed and is very characteristic of Mexican work. Their skill in making such objects has been questioned; but the large masks, mirrors, and other objects of obsidian which they made, the objects of agate and the numerous jade and jadeite ornaments, especially the votive adze presented at this meeting, and their well-known veneration for these things, for we find not only small skulls of rock crystal, but skulls inlaid with turquoises, notably the one in the Christy collection, all these might have suggested to them the making of a large skull if a suitable block of rock crystal came into their possession. The making of this skull was nothing as compared to the fashioning of the above objects. They procured the turquoise with which they inlaid the skulls from Los Cerillos, New Mexico, and why should we doubt that they were acquainted with the Californian locality for rock crystal?

Prof. E. S. Morse, of Salem, Mass., who resided in Japan for many years, and Mr. Tatvi Barba, of Japan, now of New York city, both assert positively that the skull is not of Japanese origin, the latter stating as one reason, that a skull is not considered a fit decorative object in Japan, and that so precious a material would not have been used for that purpose.

Valuable discoveries of iron ore have been made near Waukon, Allamakee Co., Iowa, and a company has been formed in Rockford, Ill., with a capital of \$4,000,000 to develop them. The ore is of high grade.

NEW YORK MINERALOGICAL CLUB.

THE twelfth meeting of the Club was held at the Peekskill Military Academy by invitation of Prof. J. N. Tilden, and was a very enjoyable affair.

The Club left the Grand Central depot on the 2 p. m. train for Peekskill, and a very beautiful two hours' ride up the right bank of the Hudson brought us to Peekskill, which is but a mile from Anthony's Nose and directly opposite Mt. Dunderberg.

Prof. Tilden met the Club at the depot and had carriages waiting which conveyed them to his house, where his cabinet was examined. He presented the Club with a number of fine specimens for their cabinet, and also presented each member with some specimens from that vicinity for their private collections.

After a short stay here the members again entered the carriages and were driven to the Peekskill Military Academy, of which Prof. Tilden has taken charge. This building stands on a hill overlooking Peekskill, and from which a good view is had of this, the most beautiful part of the Hudson. Behind the Academy stand a large elm tree with a history of its own, Gen. Putnam having hung a spy from one of its branches during the Revolutionary War. This spy was claimed by Governor Tryon as a British officer, and vowed vengeance if he was not returned. Putnam sent him the following pithy reply :

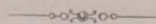
"SIR:—Nathan Palmer a lieutenant in your king's service, was taken in my camp as a spy; he was tried as a spy; he was condemned as a spy; and he shall be hanged as a spy.
ISRAEL PUTNAM.

P. S.—Afternoon. He is hanged."

Prof. Tilden and Col. C. J. Wright took us through the gymnasium, reading room, and other parts of the academy and up into the observatory, where they pointed out to us the different places of interest about Peekskill, including the residence of the late Henry Ward Beecher. After dinner Mr. B. B. Chamberlain made a speech to the boys telling them about his experi-

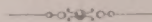
ence when a pupil at the Academy thirty-four years ago, and Rev. J. Selden Spencer, who was also a pupil at the Academy when it was located at Sing Sing, gave them a short address.

The Club left on the 7:30 train for New York City well pleased with their trip.



A Sample Millionaire.

A MINER in Leadville, Col., who can neither read nor write, is worth to-day at least \$3,000,000. His name is John L. Morrissey. The Crown Point mine, like Tom Bowen's Golconda, was just about paying expenses. Her owners offered to sell her for \$40,000. Morrissey went to Chicago and interested Diamond Joe Reynolds in the matter. Reynolds knew that Morrissey was an authority on mining, even if he couldn't write his own name. He finally purchased the Crown Point, agreeing to give Morrissey a half interest after the original sum was repaid. Within thirty days they struck a vein of high-class ore that has yielded them a monthly income of \$18,000 apiece ever since. There is said to be \$5,000,000 worth of ore in sight. Morrissey cannot even tell the time of day. If you ask him what o'clock it is, he will pull from his fob a \$500 watch, and, with a condescending air, tell you to "luk for yerself, then ye'll know I am not lying to yez."



As to the origin of petroleum, scientific men are not agreed. In the early period of American oil-mining the only question debated was, whether it was of animal or vegetable origin, or both. Of late a theory has been started that the oil is not due to the storage of organic remains under the surface, but originates from chemical combinations of carbon and hydrogen. This view of the subject has been taken up in consequence of petroleum having been found in such large masses as almost to preclude the idea of its origin in animal or vegetable deposits. If this be true, it is probable that the oil exists in still larger quantities than any which have yet been observed.

MINERALS

WE HAVE A LARGE STOCK OF FINE CABINET SPECIMENS OF MINERALS, AND ARE PREPARED TO FILL ORDERS FOR SINGLE SPECIMENS OR ILLUSTRATIVE COLLECTIONS OF ANY KIND, AT VERY REASONABLE FIGURES. WE INVITE ESPECIAL ATTENTION TO OUR FINE CRYSTALLIZED

WULFENITE, KERMESITE, ENDLICHITE,
 VANADINITE, DESCLOIZITE, HERDERITE,
 IODYRITE, STIBNITE, ZIRCON.

ALSO TO OUR MALACHITE ROOTS AND PSEUDOMORPHS AFTER AZURITE; GREENOCKITE COATINGS; IRRIDESCENT, CRYSTALLIZED CHALCOPYRITE, VELVET CHALCODITE, AND OUR COMPLETE STOCK OF FRANKLIN MINERALS.

Minerals for Commercial and Technical Purposes A SPECIALTY.

WE HAVE SUCCEEDED IN SECURING LARGE QUANTITIES OF FINE QUALITY

ZIRCON,

AND ARE PREPARED TO SUPPLY IT AT LOWER PRICES THAN IT HAS EVER BEEN OFFERED AT BEFORE.

WE DESIRE TO PURCHASE IN LARGE QUANTITIES THE FOLLOWING: NATIVE TELLURIUM, NATIVE BISMUTH, RUTILE, MOLYBDENITE, WULFENITE, CLAUSTHALITE, GADOLINITE, CERITE, THORITE, SMALTITE, STRONTIANITE, CELESTITE, TANTALATE, SCHEELITE, WOLFRAMITE, YTTROTANTALATE. CORRESPONDENCE SOLICITED.

GEO. L. ENGLISH & CO.,

DEALERS IN MINERALS,

1512 CHESTNUT ST.,

PHILADELPHIA, PA.

COLLECTORS LOOK!

Tin ore 10 cts., asbestos 8 cts., satin spar 8 cts., selenite 8 to 50 cts., rose quartz 8 cts., arsenical pyrite 10 cts., gold ore 10 cts., silver ore 10 cts., calcite 6 cts., tourmaline (black) 8 cts. Specimens are 1x1 and larger. Indian arrowheads, perfect, 12 cents. Scrapers, perfect, 30 cents. Pottery 5 cents. *Approval sheets of choice stamps* sent to reliable collectors. Everything post-paid.

W. H. PLANK, Wyandotte, Kans.

The Youth's Leisure Hour

IS A 12-PAGE MONTHLY MAGAZINE.

Devoted to GOOD LITERATURE, NATURAL HISTORY, COLLECTING, ETC., ETC.

35 cents per Year. 3 cents per Copy.

Advertising rates low.

If you mention this paper we will send ONE SAMPLE COPY FREE.

F. C. JOHNSON, Publisher,
Boonville, N. Y.

"COMMON SENSE"

Is the name of a large Coin, Stamp, and Curiosity paper, full of news. Exchange column free to subscribers. Only 25c. per year, with a genuine Shark's Egg free. "Adv." rates on application.

3000 copies each issue.

COLLECTORS

Send 25c. for one of the finest boxes of 12 different curiosities that you ever saw. Indian Arrowheads, Sea Curios, War Relics, etc., etc. Address everything to,

F. A. THOMAS, Publisher,
Mexico, N. Y.

The Agassiz Companion

Is a large 18 to 20 paged monthly magazine, devoted to the Natural Sciences and the A. A. Every naturalist should take it, and read our new serial, "The Young Scientist," for Geologists and Mineralogists.

Only 50 cents per year.

Sample copy free.

Advertisers will find the Companion a first-class advertising medium. Try it, 50 cents per inch.

THE AGASSIZ COMPANION,
Wyandotte, Kansas.

CLOSING OUT BARGAINS.

Beautiful Calcite Formations, 1x1, 5c.; 2x2, 15c. Fine cabinet specimens Calcite xls., 20c. Sulphate of Iron, 5c. Crystallized Favosites Coral, handsome, 10c. Porcupine Quills, 6c. per doz. Dakota Needle Grass, 8c. per doz. Kentucky 'offee Beans, 6c. per doz. Selenite, 3c. Small Carnelians, 6c. per doz. Sea Agate, 3c. "Pictured Rock's" Sand, mixed colors, 4c. per oz. Sea Beans and Shells, 1 to 10c. Sample copy of THE GEOLOGIST'S GAZETTE free with each order; or send 25c. for a years sub., and select 10c. worth of above as a premium.

F. R. STEARNS,
337 S. Seneca St., Wichita, Kans.

JUST RECEIVED.

A lot of Herkimer County Double-Terminated Quartz Crystals, which I can sell at 2½, 5, 10, 15, 20, 25, 35, and 50 cents each. These are the finest quartz crystals found in this country, and any collection not having some of them is not only incomplete but is without its most attractive specimen. One dozen lots 10 per cent. off.

A. CHAMBERLAIN,
284 PAVONIA AVE., JERSEY CITY, N. J.

52 Page Song Book, contains some of the most popular song of the day, will be sent free on receipt of a 2-cent stamp L. R. TONEY, Publisher, Richmond, Ind

U. S. LOCAL STAMPS.

Rare old Hussey's, Boyd's, Grafflin's, etc. Local Despatch Stamps at nearly (¾) half catalogue prices. All warranted *Genuine Originals*. Sheets of locals sent on approval. Good commission. Reference required.

20 var. original locals, 65c.

150 asst. original locals, for dealers, \$1.50.

Send for price-list.

F. N. MASSOTH, Jr.,

Hanover Center, Indiana.

MAZON CREEK FOSSILS.

Having about 100 of these celebrated fossils which I wish to clear out, I am offering them at 15 c. each, 8 for \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.

25c. Will buy one bleeding tooth shell, five red sea beans, and 20 varieties of U. S. Revenue and Postage Stamps. Specimen copy of The Old Curiosity Shop, six cents. WILL M. CLEMENS, Jamestown, N. Y.

0 PALS from Honduras. Specimens of this beautiful mineral, showing different shades of red and green, from 25 cents to \$1. A. CHAMBERLAIN, 284 Pavonia Ave., Jersey City, N. J.